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BRITISH MEDICAL JOURNAL

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GENERAL PRACTICE IN AMERICA AND GREAT BRITAIN

SOME OBSERVATIONS AND COMPARISONS

BY

CHARLES M. FLEMING, M.A., M.D., F.R.C.P.Ed.

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In the spring of 1952, through the generosity of the Rockefeller Foundation, I was enabled to make a three-months visit to the United States, the main object of which was to study conditions in general medical practice. The time seemed most opportune to see what range of work was actually undertaken there by the general practitioner, and to find out how the patient fared—the ultimate test—under the conditions of American practice. It was no part of my purpose to try to assess the general standard of American practice. Not only would that have been impossible of achievement in the time, but it was unnecessary. My object was simply to see what opportunities are available to the American doctor and how they are actually utilized.

First-hand knowledge of what happens to the American patient when he consults his doctor seemed to me essential. I had expected difficulty in at least some practices in being present during actual consultations. In the event, my fears were groundless; no doctor or patient showed even hesitancy about my presence, and I was made most welcome. A second requirement was to see what advantages accrued to patients of group practices and other medical-care schemes. From my point of view, only the scope and quality of medical care in these schemes was of special interest, since in Britain we are no longer concerned with questions of contributions, entitlement to medical care, and the many organizational aspects of such schemes. I confined my attention, therefore, mainly to what happened to the patient when he presented himself for treatment. Finally, I was anxious to visit medical schools and other bodies interested in medical education in order to learn about undergraduate and postgraduate training for general practitioners.

The task was a formidable one, and I cannot pretend to have done much more than make a rapid and limited survey. I should like to say at once that I do not claim an exhaustive or a meticulously accurate knowledge either of medical education or of practice conditions in the United States. I am satisfied about the value of what I saw and heard for the purpose I had in view, and of its correctness in principle if not in detail; but I appreciate that there must be many features of practice in the United States about which I am still ignorant. Nothing spectacular or dramatic was expected or discovered. I was able to cover only a very small part of that vast country—though my journey took me long distances by our standards—but I saw both urban and rural practice under widely varying conditions.

At all stages of my tour I was given the greatest possible help, and was enabled to see and hear far more in the time available than I should have thought possible. The simplicity and efficiency of the arrangements made for me by the Rockefeller Foundation contributed very largely to this result. Wherever I went appointments were made in advance with key people in my particular sphere of interest. But ample time was left free for other meetings and visits suggested in the course of discussions. In this way I was able to study, as my journey progressed, what I felt was likely to be of greatest value to me. The broad plan was sketched for me, but I was left completely free to fill in the details.

Places Visited

My tour began in New York, and I returned there at the end. The Health Insurance Plan of Greater New York, a very large and highly organized system of group practice, took up a good deal of my time there and proved of great interest as regards both its headquarters organization and its various group centres. I also saw the work of individual general practitioners. The three medical schools I visited—Columbia, Cornell, and New York Universities—provided a wide range of information of the greatest value, and helped me to get a working knowledge of the general set-up of American health services. During my last days in New York discussions with officials of the American Public Health Association, the Commonwealth Fund, and other bodies enabled me to put into perspective many things I had learned in the course of my visit.

Baltimore, my next stopping-place, afforded a great wealth of experience. The Johns Hopkins School of Hygiene was my temporary spiritual home, and I cannot put too high a value on the privilege of the casual daily contacts there, quite apart from attendance at more formal interviews, seminars, etc. I was able also to see something of the Johns Hopkins University Medical School, the famous Johns Hopkins Hospital, and its diagnostic clinic. In particular, I spent a considerable time studying the work of the Baltimore Medical Care Scheme clinics at Johns Hopkins Hospital, the University of Maryland Hospital, and the Sinai Hospital. This gave me a very close insight into one form of group practice and enabled me to see many general practitioners actually at work. I also attended office consultations and did house calls with private practitioners both in Baltimore and in several rural areas of Maryland. I had numerous discussions with officials of the City Health Department, and also of the State Health Department, including county health officers.

I paid a short but very profitable visit to Washington, where most of my time was spent with officials of the U.S. Public Health Service. From them I received a great deal of background information which was invaluable in assessing much of what I saw and heard during my whole visit. I also saw something there of group practice, and learned from an authoritative source about the work of the American Academy of General Practice.

The next stage of my journey took me to Cleveland, Ohio, where I was privileged to attend the annual meeting of the American College of Physicians. In itself this was a fascinating and instructive experience, but it also proved an enormous saving of time by enabling me to meet teachers from several widely separated American medical schools.

From Cleveland I went to the South, where I spent a week in New Orleans and a week in Jackson, Mississippi, and paid a flying visit to Chattanooga, Tennessee. The officials of the two medical schools whom I met in New Orleans took the greatest pains to help me in every possible way, and my visit there was one of the most useful of the whole tour. I was able to see general practitioners at work in urban and suburban practices. Jackson proved a valuable base for visits to rural doctors, and the State Health Department took endless trouble to provide information and assistance.

Returning to New York, I made short visits to Toronto and Boston. On my way to Canada I saw a very interesting development in group practice, at the Rip Van Winkle Clinic and Foundation in Hudson, N.Y. My stay at Toronto was a brief but intensive introduction to Canadian medicine, made with the help of officials of the School of Public Health, the Medical School, and the Canadian Medical Association. Here also I was able to see general practice at close quarters.

Boston was well up to expectation and I had a short concentrated visit which included the Harvard Medical School and School of Public Health, Boston University, and the New England Medical Center.

In this report I have not attempted to record my experiences in detail. That was done in diary form each day during my trip. While I have found my diary a most valuable personal *aide-mémoire*, it is by no means a complete account of all the many interviews and discussions in which I took part. In common with all visitors to the United States, I experienced boundless hospitality, and on these social and semi-social occasions I obtained a great deal of information of high professional interest and value. Indeed, I am tempted to believe that many of the most useful lessons of all were learned in this way. Impressions of American medical practice acquired by either of these methods are insensibly and inevitably modified by all the other experiences packed into such crowded days. What I have written here is based on my experience as a medical officer concerned in the administration of general practice in the National Health Service, modified by my experiences in the United States. I have tried to describe briefly the training and working conditions of the American general practitioner and to make some comparisons with what obtains in Britain. I have then attempted to define the scope of general practice. Finally, I have put forward some suggestions on what might be done for the future development of general practice in Great Britain.

I. THE AMERICAN GENERAL PRACTITIONER

School, College, and Undergraduate Medical Training

In the United States most children go to school at the age of 6, and they are in the primary school for approximately eight years. They then proceed to their secondary education at a high school for about four years.

A prospective medical student, on leaving school, usually takes an arts or science course at college. At least three years, and often four, are spent in this way, and most students graduate with an A.B. or B.S. degree. Certain subjects, such as physics, chemistry, botany, and zoology, are obligatory. English and mathematics are usually taken, and many schools also require a foreign language. Not more than the minimum is required in science, and stress is placed on sociology and philosophy. The intention clearly is to encourage the student in every way to get a good general education.

Undergraduate education at a medical school lasts four years and leads to the M.D. degree. Speaking broadly, the course consists of the subjects which in this country follow the first M.B. examination.

In the United States, as here, it is being appreciated in many quarters that the student who sees only people in hospital beds or who attends out-patient departments is missing a most important section of illness in the community. Moreover, two present-day trends—the smaller number of house visits made by American doctors, with the consequent tendency for the patient to become the sole judge of when he should see his doctor, and the shortened average stay in hospital—result in the medical student seeing even less than formerly of the beginnings and consequences of illness. Some medical schools have therefore made provision for students to gain experience in domiciliary medical practice. Patients are assigned to students, who look after them both in hospital and at home. Guidance is given by a senior, every care being taken to avoid interfering with the rapport established between the student and the patient. The student stands in something of the relationship to the senior that the general practitioner does to the consultant. The value of team-work is emphasized by showing the use that can be made of social workers, health visitors, and the full range of community resources. The importance of such teaching in clinical and social medicine is obvious. The student is given an early opportunity of appreciating the practical value of the concepts of preventive medicine as applied to the individual patient and his family.

The Internship

The next stage consists of one year's training as an intern (H.P. or H.S.). According to Pullen (1952a) about half the States require a doctor to have served an internship before they will grant him a licence to practise. The licensing examinations are, incidentally, quite separate from the degree examinations. An American Medical Association report states that for over 20 years practically every graduate of an American medical school had voluntarily acquired a year of hospital experience and that by the mid-'thirties more than 75% were completing two years and more of hospital training before entering on the practice of their profession (Diehl *et al.*, 1950a). The rotating internship, consisting of three months each of internal medicine, surgery, paediatrics, and obstetrics and gynaecology, is the most common type. Great importance is attached to this form of training, and it is an absolute prerequisite to many later appointments and advancement. There are also "straight" internships in these subjects. In a straight internship in surgery, eight months would be spent at general surgery and the remaining four months at surgical specialties. Similarly, the last four months of an internship in internal medicine would be spent in paediatrics, psychiatry, neurology, etc. The American Medical Association controls this training, in so far as it certifies hospitals at which credit may be given for an internship. At present there are many more internships than young graduates of American medical schools. In 1951 there were only 6,135 medical graduates to fill 10,044 internships (Pullen, 1952b). This leads to competition, with the result that some hospitals pay much more attractive salaries than others. It is said that some of these hospitals do not make any great effort to teach.

Graduate Training

Graduate or residency training is intended for the trainee specialist, and may be said to correspond to the period of a registrarship in Britain. It may last from two to five years, according to the specialty. There are over 20 specialty boards in the United States; each lays down what the training for its own specialty should comprise and conducts the examinations. The American Medical Association has begun to certify hospitals which should be approved for specialty training. As with approved internships, there are more residency vacancies than there are trainees, and this has again given rise to unfortunate results. The percentage of failures at the examinations of the specialty boards is considered by many to be unduly high. Actually, it is probably not very different from what obtains in this country in the higher examinations in medicine and surgery. Darley (1952a) put the proportion of failures in 1949 at an even third. In his presidential address to the American College of Physicians in 1952, Pincoffs (1952) attributed the high percentage of failures partly to the inadequate training given by some hospitals.

Some American schools have in recent years provided, in addition to the year of internship, a three-years general practice residency—consisting of one year of internal medicine, one year of surgery, and one year of obstetrics and gynaecology. This is a particularly interesting development in that it places general practice on the same level with regard to length of training as most of the major specialties. Unfortunately, and for various reasons, according to some of those intimately concerned in the promotion of these residencies, they have not been an unqualified success. It is suggested, for example, that the general-practitioner resident takes second place in training to the specialist resident. An alternative—attractive in more than one way—has been put forward whereby, after a period as an ordinary resident, the trainee general practitioner would go to a special hospital where the staff would not be members of a university faculty or medical school, but would, of course, be thoroughly imbued with the spirit of teaching.

Postgraduate Training

At least two agencies in the United States are actively engaged in stimulating postgraduate education with an enthusiasm and energy not equalled in this country. The American Academy of General Practice requires of its members certain minimum amounts of formal and informal instruction, and its local branches arrange to have the necessary courses and other forms of instruction made available. A number of medical schools are concentrating on providing general-practitioner postgraduate training, even to the comparative neglect of specialist training. There are, of course, variations in the courses provided at different medical schools, but the following are the main types:

(1) Short intensive courses of from one to three days are held perhaps every two to four weeks. Lectures, clinical pathological conferences (C.P.C.s), and panel discussions are given. The short length of some of these courses makes it easier for the general practitioner to attend without leaving his practice, a point of great importance in the United States. This type of instruction is very popular and the demand is steadily increasing. One medical school had 1,000 registrations in one year—a most impressive achievement, as the total number of general practitioners in the State is 1,600. The greatest care is taken to appeal to the general practitioners by framing the courses to meet their calculated needs and by employing a number of carefully designed methods of holding their interest.

(2) Through the generosity of the Kellogg Foundation, about 20 medical schools are now providing a most attractive scheme of postgraduate instruction. The essence of it is to bring the instruction to the doctor in his practice. A teaching team of two or more members of a medical faculty is sent to a small peripheral hospital of perhaps 50 to 80 beds. A morning ward round is made and the doctors see their own patients examined and demonstrated. In the afternoon more of the doctors' patients are seen as out-patients. The evening may be employed for a lecture or talk. Variations of this programme are, of course, used by different teaching schools.

(3) Evening courses once a week for 12 weeks are held by some schools. Each week a different team, usually of two, attends. Patients may or may not be used. These courses are normally built around the local medical society.

Perhaps the most striking feature to the British visitor of all these courses is the care devoted to making them attractive and useful to the general practitioner.

General Practice

Entry into Practice.—The American general practitioner enters practice as a rule straight from an internship and learns his new job by experience. Some doctors, before beginning practice on their own, serve a period as an assistant to an experienced practitioner, though this arrangement seems to be less common than in Britain. Naturally, a certain number of entrants to general practice have had residency training for varying periods. Some of the latter aim at becoming specialists in, for example, internal medicine. To do so, they may seek the Certificate of the Board of Internal Medicine or of one of the other specialty boards; but such doctors can acquire consulting practices solely by gaining the confidence of their fellows.

The "Family Specialist."—It is necessary to consider in relation to American general practice a type of practitioner unknown in Britain—the "family specialist," he might be called. These doctors may be orthodox specialists with the certificate of the appropriate board, or they may merely have taken a long period of hospital training. They do, however, limit their practice to their specialty, which is usually internal medicine or paediatrics; but they are prepared to accept patients direct in the same way as a general practitioner. In addition they may do some consultant work. Such practitioners are still relatively uncommon; but the total number of doctors specializing in internal medicine is growing rapidly in America. The President of the American College of Physicians stated that in 1940 there were roughly 6,400 and in 1950 about 11,600. He predicted that the number would have risen by 1960 to 20,000 or 25,000, and that there would be a growing demand by the public adequate to absorb at least all those who engaged in this form of family practice (Pincoffs, 1952).

Types of Practice.—In urban areas, individual practice is still the usual form seen; but group practice is now quite common and is widely accepted. The object of such groups is to provide practically complete medical care on a prepayment basis, and the staffs comprise both general practitioners and specialists. Individual practices in these areas may be run by general practitioners or by the family type of specialist. In semi-urban areas one or more doctors may endeavour to limit their practice to internal medicine and may combine such a family practice with a limited amount of consulting work. No doubt examples of group practice in these areas are also to be found, though I did not encounter them. I did see, however, in a rural area, an interesting example of group practice, though as a rule in such places the individual general practitioner still reigns supreme. Indeed, the rural practitioner in America commonly goes beyond the usual scope of general practice as we know it; he may do a considerable amount of specialist work—in particular, major surgery.

Accommodation, Equipment, and Staffing

The American practitioner often has professional accommodation and equipment on a scale seldom seen in this country. It is perhaps dangerous to generalize on the basis of such a limited number of doctors' offices as I had the opportunity of seeing, but I can say that I never met any doctor who had less than three rooms and whose equipment was not well above the British average. The three-roomed suite—waiting-room, consulting-room, and examination or treatment room—is gradually appearing here, and is advocated in all reports and articles on health centres or group practice. In the United States it was, in my experience, the basic minimum. More elaborate accommodation, often in *ad hoc* buildings, was quite common. Developments of this

sort were by no means limited to urban areas, and indeed perhaps two of the best *ad hoc* buildings I saw were in small rural practices in Mississippi. While I did see examples in country practices of old-fashioned waiting- and consulting-rooms with well-worn furnishings—to me, not at all unpleasant features—these were uncommon. Even so, they differed from many similar premises in Britain in that they contained all the essential modern diagnostic equipment of general practice.

Equipment was usually elaborate by our standards. Examination couches were of particularly good quality and design and, more important, were not merely for ornamental purposes. It was quite common to find a short-wave diathermy machine, ultra-violet ray lamp, electrocardiograph, and a well-equipped *x*-ray and dark room. B.M.R. apparatus, surprising to the British visitor, was by no means a rare piece of equipment to encounter. Oxygen and anaesthetic apparatus were sometimes in evidence. Refrigerators for the storage of biologicals, dressings trolleys, and weighing machines with height measures might be said to be standard equipment in most doctors' offices.

Domestic staffing was in keeping with the amount of accommodation. Practitioners made great use of ancillary staff, such as nurses, technicians, and secretaries. I saw only two doctors who did not have a nurse (not necessarily fully trained) to assist them; the wife of one of them, however, did a certain amount of less skilled nursing work. Commonly, the nurse undertook simple laboratory tests and secretarial work, but a separate secretary-receptionist was often employed, and sometimes also a technician. In group practices, furnishing and equipment are on at least as good a scale as in the best type of individual practice. Sometimes a standard is reached which has to be seen to be believed by the visitor from this country. The first experience I had of a waiting-room belonging to a New York group made me feel I was in the lounge of a luxury hotel. Laboratory work in such group practices is sometimes quite complete, and no work has to be sent elsewhere.

Laboratory Facilities

Clearly, many American practitioners are equipped to carry out a considerable number of diagnostic investigations in their own premises. In addition, they seem to have no difficulty in getting more elaborate work done at hospital laboratories or at other laboratories run on a purely commercial basis. Indeed, some city doctors rely almost completely on commercial laboratory investigation, rather than employ a technician or do their own laboratory work. It is a common criticism of American medicine—heard more often, I should say, in America than in Britain—that too many laboratory tests are performed. Hawkins (1952), describing his impressions of postgraduate education in America, remarks that "in Britain the clinical approach and good bedside teaching are characteristic, whereas in America the laboratory aspect is highly developed." He at once adds that such a generalization does "an injustice to the many outstanding medical men of the U.S.A. whose clinical acumen is beyond reproach." Arnott (1952) was greatly impressed in America by the emphasis placed on the simple clinical methods of history-taking and physical examination, and saw no tendency whatsoever to rely on esoteric laboratory tests. These British writers refer to hospital practice.

The opposite view, this time in relation to practice outside hospitals, is expressed by McCombs (1950), of Boston, who speaks of certain doctors employing as a means of profit diagnostic tests that they are not qualified to use. My own experience was that the good general practitioners, like the hospital clinicians quoted above, did not abuse laboratory tests. It is a foolish attitude, that is sometimes assumed by critics of American practice, that few of the laboratory tests used are really required. General practitioners in Britain would do well to avail themselves of all useful corroborative diagnostic evidence according to the best standards of modern hospital practice.

Hospital Appointments for General Practitioners

Attitude to the Problem

A large proportion of American general practitioners have some form of hospital appointment. This seems to apply in both town and country practice; almost every doctor whom I met had some form of association with a hospital. A statistical investigation made in Baltimore in the early 'forties showed, I was informed, that approximately 45% of practitioners had really satisfactory attachments to hospitals, that 35% had no attachment, and that the rest had rather slender attachments. A statement that in one large city only 56% of the general practitioners had a recognized hospital affiliation appears in the recent Report by the President's Commission on the Health Needs of the Nation (1952a). The figures for these two cities are quoted as disappointingly low from the American point of view. In Britain such proportions of general practitioners with hospital attachments would be regarded as startlingly high. I am unable to say accurately to what extent hospital appointments for practitioners are available throughout the whole country; but there is ample evidence to show how vastly different is the American attitude to our own in this important question.

For example, the Report of the Hospital Survey for New York (1937), after stressing that the public must be concerned with the relationship of the hospital and the practitioner, goes on to state: "To keep up with the ever-changing methods of diagnosis and treatment, the medical practitioner needs the stimulus provided by association with the organized medical staff of a well-equipped modern hospital." Similarly, the Hospital Council of Greater New York (1951a) states that not only should a practitioner have the privilege of caring for his own private patients in hospital, but that he must have the opportunity to work under supervision in the wards and out-patient department and to participate in the teaching and training of medical students, members of the house staff, and other physicians. The Subcommittee on Medical Care of the American Public Health Association (1949a) reported: "General elevation of medical standards requires the closest possible contact of all practitioners in the community with the hospital facilities that are available. Good care is impossible to provide in isolation from the consultants, laboratories, equipment, and other facilities of the modern hospital."

Types of Appointment

In the United States a regular staff appointment gives the opportunity of looking after patients in the wards and out-patient department. The holder is given specific duties and responsibilities towards public patients, and he takes part in all the educational activities of the hospital. Where a practitioner merely has the right to attend his private patients in hospital he is said to have private-patient privileges. Private patients and semi-private patients may be in single rooms or occasionally private wards. In general, patients in wards are those who cannot pay for private care, and they are looked after without charge by a doctor on the staff. The doctor with only "privileges" may, in a well-organized hospital, be subject to certain limitations in the procedures he may carry out; his work is to some extent supervised. But he has no responsibilities in the wards or out-patient department, and he is not required to attend staff conferences or participate either as a learner or teacher in the educational side of the work of the hospital. Where a doctor has both a regular appointment and private-patient privileges he is said to have a combined appointment.

New York City Appointments

In New York City on January 1, 1948, there were 17,703 licensed medical practitioners, of whom 14,850 were doctors in active practice. Doctors in related fields (administration, public health, research, teaching, etc.) and doctors in training (residents, interns, etc.) were excluded in calculating the number in active practice. Over 80% of these doctors.

including specialists and general practitioners, had hospital appointments, as the following figures show :

No. of doctors with hospital appointments:			
Combined or regular appointments	10,602 ..	71%	
Private-patient privileges only ..	1,770	12%	
	12,372		83%
No. of doctors with no hospital appointment	2,478		17%
Total No. of doctors in active practice ..	14,850		100%

As there are estimated to be 7,000 specialists in the city, most of whom have hospital appointments, then more than 5,000 general practitioners must have hospital appointments. It is also estimated that most of those 2,478 doctors with no hospital appointments are general practitioners. In other words, two-thirds of the general practitioners have hospital appointments (Hospital Council of Greater New York, 1951b).

A Comparison with Scotland

The Hospital Council makes the claim, which at first sight is quite astonishing to the British reader, that to provide combined appointments for all doctors in active practice in New York City would require no appreciable increase in the existing 32,652 general-care hospital beds. (This number of beds is little short of the 33,600 recommended for 1950 by the Master Plan for Hospitals and Related Facilities. It is said, however, that a redistribution is required in view of the relative shortage of semi-private facilities : there were 12,724 private and semi-private beds.) (Hospital Council of Greater New York, 1951c.)

In Scotland in 1952 there were 2,400 principals and 306 assistants in general practice under the National Health Service, making a total of 2,706 ; and specialists numbered 826, including those working both part-time and whole-time (registrars, interns, and specialists not engaged in general care excluded). The number of general practitioners not working under the National Health Service is probably less than 50, so that the total number of doctors in active practice seems to be about 3,500. General-care beds are about 27,583 for a population of 5,000,000 (Report of Department of Health for Scotland, 1952).

In New York City there are then, in proportion to the population of 7,888,000, more than two and a half times as many doctors (general practitioners and specialists) in active practice and more than five times as many specialists as in Scotland. Relatively, general practitioners are almost twice as numerous in New York. On the other hand, Scotland has proportionately about four beds for every three in New York. The highly urbanized needs of New York cannot truly be compared with the needs in Scotland either of doctors or of hospital beds, but the ratios are so different that they may well not be completely accounted for by differences in the type of population. Indeed, it could be argued that any difference in needs would serve only to accentuate the differences in the ratios shown above.

At least two points stand out. First, it would be simple, if our Scottish hospitals were run on the American principle, to find hospital appointments for all doctors in practice. Such a revolutionary change, even if desirable, could clearly not quickly be effected. But, at the very least, it is reasonable to argue that no vast modification is required to find useful employment in hospital for a considerable number of general practitioners. Secondly, the question at once poses itself : does the American method of practice not seem to be much more economical in the use of hospital beds ?

Conditions for American General Practitioners in Hospitals

Among the recommendations of the Hospital Council of Greater New York (1951d) it is urged: (1) that all hospitals appoint general practitioners to their staffs and, under the jurisdiction of the chiefs of the various services, give them the opportunity of working in different departments, and the educational advantages afforded by the institution ; and (2) that general hospitals establish appropriate professional units to guide the activities of general practitioners on their staffs, and work out a programme for each individual practitioner with the various clinical departments. It is understood that the extent of hospital privileges given to a doctor should depend on his training, experience, and competence, and that his work should be supervised.

Departments of General Practice in Hospitals

The American Academy of General Practice has prepared "A Manual on the Establishment and Operation of a Department of General Practice in Hospitals." In the preparation of the Manual the Academy obtained advice from the American Medical Association, the American College of Surgeons, and the American Hospital Association (Editorial, 1950).

The Manual advocates that the general practitioner as well as the specialist should be able to use the modern hospital to the degree that his training and experience warrant. It is recommended that the medical staff should be organized into at least three departments, consisting of medicine, surgery, and general practice, and that within the last-mentioned section the general practitioner should be given hospital privileges in the practice of internal medicine, paediatrics, obstetrics, and surgery as determined for each applicant by the credentials committee of the staff. It is laid down how the evaluation should be made of the qualifications and ability of those members of the general practice staff who feel that they have had the necessary training and experience to engage in more advanced work within a specialty field.

Scope of General Practice in America

The scope of the general practitioner's work in America is a good deal wider than here. This, at least in part, explains his more elaborate diagnostic and therapeutic equipment, much of which he must find really necessary for his work. It is not entirely a matter of his own choice that he practises a wider range of medical work ; his patients expect it of him. This may explain the occasional major surgery by general practitioners which is still done in places like New York and Baltimore, where expert surgical skill abounds. This situation has both its good and its bad features. There is great interest and stimulation for the general practitioner to investigate and treat his patients with a full range of diagnostic and therapeutic facilities, such as is available here only to the hospital specialist. This seems to be accepted practice, for the Subcommittee on Medical Care of the American Public Health Association (1949b) stated : "With the receipt of complete consultation reports, the general practitioner can usually continue with the management of all but the most specialized therapeutic procedures." Moreover, American general practitioners seem to have a familiarity with the appropriate methods for such work almost unknown among their British colleagues. It is idle to discuss, on my slender experience of American practice, whether the work done is on the whole more efficient than in British practice. What I endeavoured to learn was what the general practitioner could do, given the necessary facilities. I am satisfied that he can and does do a better job in many, but not all, ways than is done by the general practitioner here.

Group Practice in America

Definition of Group Practice.—The term "group practice" has a different meaning in the United States from what is usually implied when it is used in this country. The Medical Group Practice Council (1946a) has laid it down that "in order to be considered a medical group practice unit, an association of physicians of different skills, using medical equipment and nursing, technical, and administrative personnel in common, must have a formal pattern of professional collaboration, a definite relationship as a group with a hospital or hospitals in the community, and a unified administrative and financial organization." A formal pattern of professional collaboration means that the consultation and co-operation between the different types of doctors in the group are definitely planned so that they are

readily available for the patient's benefit. A unified administrative and financial organization requires the pooling of incomes and that financial relations with patients are handled in the name of the group. It is accepted that three or four doctors sharing accommodation and auxiliary personnel are not engaged in group practice, although they may enjoy some of its advantages.

Types of Group Practice.—This form of organization is, of course, merely an extension to outside practice of what has long obtained in teaching hospitals. As Clark and Clark (1941) put it: "Having been trained in the group method, the medical graduate of to-day is well-fitted to continue his career as a member of a professional group where he can practise the type of medicine he has been taught. It is often difficult, on the other hand, for him to adjust himself to the professional and financial limitations of individual practice." We are not concerned here with reference groups such as the Mayo Clinic, or diagnostic groups like those at Johns Hopkins Hospital and elsewhere. The principal other type is that which provides general family care and specialist services.

Advantages of Group Practice

The doctor is able to do his best work, having readily to hand access to the necessary specialist advice and diagnostic and therapeutic facilities. At the same time economy is effected through sharing of accommodation, equipment, and ancillary personnel. The saving has been estimated at from 15 to 30% (Medical Group Practice Council, 1946b). There is also an economical use of medical manpower in that the young doctor is at once fully employed and has no long period of waiting for patients in a newly established practice. Indeed, the view has been advanced that the United States "cannot afford the wastage entailed in the partial idleness of the solo practitioner while he is building up a practice" (Report by the President's Commission on the Health Needs of the Nation, 1952b). Moreover, the doctor has opportunities for private study and attendance at postgraduate courses, and is enabled more easily to work at any specialty in which he may wish to develop his knowledge. All doctors in group practice have, of course, the benefits of sharing night duty, emergency calls, and so on.

For the patient the advantages are not limited to having the advice of the appropriate specialist: that could be obtained under almost any form of practice. The fundamental justification for group practice is the opportunity it offers for greater efficiency in the key member of the team—the family doctor. He is enabled to continue the best features of his training period throughout his professional life—"the stimulation to keep up with medical progress through constant appraisal by informed colleagues and ready access to consultations and technical assistance" (Report by the President's Commission on the Health Needs of the Nation, 1952c).

Examples of Group Practice

The Health Insurance Plan of Greater New York (HIP) has as its aim to provide comprehensive medical care—preventive, early diagnostic, and curative. The entire cost is covered by combined HIP and some form of hospital insurance such as Blue Cross. It began in March, 1947, and was responsible for the care of almost 400,000 persons by 1953. Medical services are available in the homes of patients, in doctors' offices, in medical group centres, and in hospitals. There are 30 medical groups scattered throughout the city. Each group has a sufficient number of family physicians for its size, the appropriate number of specialists representing the 12 basic specialties, and it has the requisite laboratory, *x*-ray, and other diagnostic and therapeutic services. Almost a half of the 950 doctors employed in the scheme are diplomates of the American specialty boards.

The medical groups are autonomous and each is a professional partnership. They are required to meet definite professional standards and to provide specified facilities.

The scheme is, of course, a prepayment one, and subscribers may choose any medical group and any one family physician. After deduction of administrative expenses the income is distributed to the groups on a capitation basis.

The family physicians see most of their patients at their own private offices, which are usually nearer the patients' homes; but generally they also have certain office hours at the group centre. The specialists see most of their patients at the centre.

The medical director claims that the maximum amount of diagnostic and therapeutic procedures is carried out on an ambulatory basis and that in consequence many hospital beds are saved. He also claims that in hospitals where members of the staff practise group medicine the family physicians in the scheme become essential members of the hospital group and enjoy all the educational advantages of an intimate hospital relationship. Moreover, the hospital has the advantage of being more intimately related to the medical and socio-medical problems of the community (Baehr, 1953).

Many other schemes in the United States provide in one way or another useful and continuing postgraduate associations with medicine as practised in hospitals. In addition to HIP, I have referred above to the medical care scheme in Baltimore. I was also able to see the Bingham Associates Plan in Boston. It is impossible here to give a detailed description of these schemes. Many of their features are, of course, concerned with means of providing medical care, but they afforded me excellent opportunities of studying certain aspects of general practice in the United States, and particularly the association of the family doctor with the hospital and teaching centre.

Is the Pattern of American General Practice Wholly Satisfactory?

I certainly saw much in the United States that showed me how our own standards could be improved. I realize there may be, as I have been told, general practitioners of poor standard. But I was concerned only with the achievements possible under American conditions, the potentialities of that type of practice. Obviously the American doctor has more time to see his patient: he requires it to practise his wider range of skills. Again, he must give a patient who is paying a high fee a consultation of some length. These things are in his favour and, apart from cost, in favour of the patient. But sufficient time for every patient will probably long remain, even in America, a counsel of perfection. There will always be a need to do what must be done and to leave at least some of the other less necessary things undone. The art of practice—and it is still an art despite modern scientific resources—will consist then in doing for each patient what he or she most requires.

I should hesitate to criticize American general practice on the basis of the small sample of it I saw. It did seem to me, however, that more time might sometimes have been given to consideration of the patient as a person. It may be this is due in some measure to preoccupation with instrumental investigation, laboratory tests, *x*-ray examinations, etc.—and time, as always, is the enemy. At any rate, the "history" sometimes seemed rather a stereotyped interrogation. It is but fair to say that one of the doctors who best appreciated the importance of establishing rapport with his patient, of considering emotional factors, and of viewing the patient as a person, was the possessor of quite the most elaborate accommodation and equipment I saw anywhere.

It is also difficult on my limited experience properly to assess the value of the American family internist. For some Americans, possibly an increasing number, he takes the place of the general practitioner, within the limits of his restricted form of practice. Possessed of over-average experience in internal medicine, he may surpass the general practitioner in the technicalities of medicine. If the general practitioner neglects what he is best qualified to do—act as

family guide, philosopher, and friend—and enters into competition in another's chosen field, he is destined to defeat. However able the family internist may be, he is bound to be at a disadvantage in the role of family doctor as compared with the general practitioner adequately grounded in internal medicine, who is present when the children are born, who advises the mother about the bringing up of her family, and who is the first to be called in time of illness. The family internist is not, of course, a specialist in the ordinary sense. He seems usually to do at least some very minor surgery, dermatology, eye work, etc. Clearly, it must be well-nigh impossible for him to limit himself rigidly to his specialty, though he will certainly not engage in obstetrics or paediatrics.

The family paediatrician also has no British equivalent. Much of his work is child welfare; and in that he probably has more experience than the paediatric specialist in Britain, who is mainly concerned in the care of sick children. I have discussed the question of the family paediatrician with doctors in that form of practice and with paediatric teachers in medical schools. They agree that a general practitioner who is adequately trained in internal medicine and has a reasonable knowledge of other branches of his work, including paediatrics, can give entirely adequate care to children, well or ill, provided he has access to specialist help when necessary.

If, then, these family specialists have a technical lead in their own sphere over the good general practitioner, it must be reduced by a relative lack of the real basis of general practice—knowledge of the patient, his family, his work, and his background. There are undoubtedly some who consider that the internist is the one who should be concerned chiefly with the very personal type of care which most people require, that he should take over such duties from the general practitioner. Darley's (1949) wise answer is: "If this is to be so, the training of the internist will have to be much different from what it is to-day."

At the beginning of my visit a knowledgeable adviser told me that someone of considerable standing in the profession had recently said to him that the general practitioner in America was a disappearing entity. He added that he did not himself believe the statement but would be interested to hear what conclusions I came to after my survey of general practice. I can answer emphatically that I saw no reason to fear for the future of general practice in America.

Darley (1952b) states that between 1938 and 1949 there was a 19% increase in the total number of doctors, and that specialists increased 98%. Pullen (1951), after quoting similar figures, says "the pendulum is swinging and the general practitioner is coming into his own." He quotes student polls by the Council on Medical Education and Hospitals of the American Medical Association which indicate that the percentage of students planning to enter practice has increased from 36 to 47%, and that the number planning to specialize has decreased from 36 to 31%. Whatever may be said of these figures, general practitioners still constitute 47.5% of doctors registered in the United States, while specialists form only 27.3%; the remaining 25.2% are interns, residents, Government servants, etc.

I was most impressed, not by figures, but by the standard of work I saw done by certain general practitioners, the reactions of patients, and the refreshing confidence of all in the future of general practice. This confidence was undoubtedly contributed to by the success of the American Academy of General Practice. With its membership of 17,000 it has already done a great deal to enhance the status of the general practitioner.

II. THE BRITISH GENERAL PRACTITIONER

School and Undergraduate Medical Education

In Britain, school education begins and ends, generally speaking, at the same ages as in the United States. I have no information on the relative standards of attainment; but, presumably, any balance in favour of one or other country must be a small one. The American medical student has then a rather longer preparation for the study of medical subjects, while his British counterpart devotes a little more time to the medical course proper. Everyone who has written about the place of general cultural studies in the training of doctors agrees about their importance. If the preliminary cultural requirements in the United States are greater than here, we must acknowledge their value and criticize, if at all, only on the grounds of cost and practicability. Whether as much ground is covered in their shorter medical course I cannot say, but most people who have intimate knowledge of American medical schools speak of the great industry of the students. No doubt there will be difference of emphasis in the teaching as between the two countries, but it is enough here to say that in Britain and America the medical student receives a very high standard of training.

As in the United States, some medical schools in this country have made provision for introducing the student to the problems of general practice. Similar developments in association with health centre practice are now being introduced.

Graduate Training and Entry to Practice

In Britain to-day there is so much competition for practice vacancies that the doctor without adequate postgraduate experience in hospital and as an assistant has little chance of becoming a principal. Most informed people agree that entry into practice is at present too difficult, and a good deal of harm has resulted from this state of affairs. On the other hand, one beneficial consequence is that adequate preliminary training is now practically ensured. Other developments are leading in the same direction. From January 1, 1953, a doctor must serve a year as an intern before registration.

A committee under the chairmanship of Sir Henry Cohen produced a report on "General Practice and the Training of the General Practitioner" (British Medical Association, 1950a). The report recommends for general practitioners a three-year period of training after registration—that is, four years after graduation. The first of these three years will be spent under the supervision of a general practitioner, the second year in specially designed hospital appointments, the third year will include a choice of opportunities in hospitals and as an assistant or locum in general practice. The Report of the Working Party on the Distribution of Remuneration among General Practitioners (1952) laid down as a qualification for an Initial Practice Allowance (a grant to assist doctors to set up in practice) that the applicant must have been in general practice for not less than two years or have been registered as a medical practitioner for not less than four years. The trainee assistant scheme under the National Health Service has enabled many specially suitable doctors, not otherwise available as trainers, to have assistants; it has thus provided young doctors with an opportunity of an assistantship under favourable conditions for real instruction in the problems of general practice.

The Registrar Problem

A somewhat special situation, presumably temporary, has arisen as a result of more registrars (trainee specialists) being employed in the hospital service than seem likely to be absorbed by promotion to the rank of full specialist. Some of these doctors have decided to give up their attempt to become specialists and have tried to enter general practice. It is natural that, having been qualified for perhaps three and often more years, they should attempt to obtain a practice without a period of assistantship, but such attempts have not as a rule been successful. These doctors should eventually prove to be valuable recruits to general practice if they have the requisite qualities of personality. Even where their postgraduate training has been of a very special nature it should be by no means wasted. The

potential worth of all these doctors with their long hospital training is very high indeed, and could be realized if they were enabled to find part-time hospital appointments in their specialty in addition to working in general practice.

Postgraduate Training

Whatever the defects, then, that may have existed in graduate training for entrance to general practice, they are being steadily reduced. The Cohen Report points out that there has in the past been a tendency "to regard the postgraduate education of the general practitioner mainly as a matter of occasional refresher courses and lectures." The report wisely advances the view that this is far too narrow a conception and that "professional education should be a continuous process extending throughout the practitioner's active life and forming part of the very fabric of practice" (British Medical Association, 1950b). As has been shown, this view is not only shared in the United States, but steps have been taken by some medical schools to cater appropriately for the continuing educational needs of general practitioners. The American Academy of General Practice, by requiring of its members a minimum of 150 hours of informal instruction and 50 hours of formal instruction over three years, has done a great deal to ensure regular, rather than merely occasional, postgraduate instruction. The deans of the American medical schools which are successfully offering regular and well-planned general-practitioner postgraduate courses are no less deserving of credit. In Britain a College of General Practitioners has lately been founded. Certain postgraduate educational requirements are already demanded by it of some of its members, and later these may well be extended.

Health Centres

The present policy of both the Government and the British Medical Association is that health centres should meantime be regarded as experimental only. Quite recently a few centres have actually been completed. It is only reasonable to wait for the results of running these centres before coming to final conclusions. The large type of centre has, however, proved expensive to build, and more interest is now focused on the possibilities of the smaller type. Some hope that in the health centre will be found a solution to the problem of co-ordinating the three parts of the Service and of raising the standard of general practice by providing good accommodation, equipment, and ancillary help. The practitioner in the centre, it is argued, will be in an unrivalled position to use the full resources of the community.

The main argument used in favour of health centres and group practice, so far as general practitioners are concerned, is that the doctor, if he is to be able to use efficiently the resources of present-day medicine, must have working conditions which, in this country, are scarcely possible in independent practice. The standard of accommodation, equipment, and staffing in the United States is strikingly good; but no general practitioner can make sufficient use of the more expensive articles of equipment mentioned earlier, of which *x*-ray plant is the most obvious, to make them justifiable, except on a group basis, in a publicly organized service. The same argument applies, in a less degree, to accommodation and staffing. It is possible, however, to have on an economic basis for a single-handed practitioner adequate accommodation and ancillary help. One of the best general practitioners I saw in America—so far as I was able to judge with my limited opportunities—had good but certainly not lavish accommodation, and was assisted by a lady secretary-receptionist who assisted with minor nursing and laboratory work. This doctor, with a good-class practice, came as near to the ideal as anyone could, humanly speaking, expect. In addition to ordinary consultations, he did a considerable amount of maternity and child welfare work and routine overhauls of patients who wanted that form of advice. On the whole, however, it is as a rule easier to provide an efficient standard of accommodation and staffing when doctors are working in a group.

We must ask ourselves if our present conception of a health centre is adequate. The family doctor working in a centre may well have a closer link with the advisory services provided by the local authority and with the medico-social agencies in the community. But the association of general practitioners with specialists in health centre work is almost non-existent in many of the types of centre so far in being. The Report of the Nuffield Provincial Hospitals Trust (1951) records, however, how the Trust has supported a project to provide a diagnostic health centre for general practitioners; and, jointly with the Rockefeller Foundation, has assisted in a most promising scheme for a health centre, which when fully developed will provide facilities for teaching general practice to undergraduates, and where the family doctors will not only have appointments at hospital but will undertake local authority clinic work. These are excellent experiments, and have the merits, among others, not only of giving much needed diagnostic facilities to general practitioners, but of securing for them an association with hospitals.

Are General Practice Conditions in Britain Satisfactory?

Whatever criticism may be levelled at the training given in medical schools, no one would say it was unsound or grossly inadequate. No doubt it could be improved: of necessity, since conditions are always changing, that will always be so. It is by no means a complete training for practice, nor is it intended to be. As Welch (1910) wrote: "The student cannot go out a trained practitioner, a trained pathologist, a trained anatomist, or a surgeon. Looked at from the point of view of knowledge alone, he has only a smattering. The training of his powers and methods of study are the important things. He should be put in a position to continue his own education." But, even so, the young doctor entering practice, though his education is admittedly still incomplete, is reasonably well equipped to begin the practice of a wide range of medicine and to complete his education by practical experience and further study.

What is so striking is that, however limited are the skills that have been acquired, many are so often and so soon lost in practice. Other skills and experience may compensate, but the loss is still a real one. The problem is to provide not only continuous postgraduate education but the opportunity to use every talent to the fullest extent. If, in addition to the compulsory year of internship, entry to general practice develops on the lines of the Cohen Committee's recommendations, recruits to general practice of an even higher standard should come forward in the future. That would be a welcome development, but some of the benefit may be lost unless conditions of practice are altered. The American practitioner has more time to deal with his patients. Until many British general practitioners can arrange their affairs so as to have much more time than at present they cannot hope to undertake the full scope of practice so desirable for their own continuing interest and efficiency. In the same way, adequate access to diagnostic facilities and some useful association with hospital work are imperative. The recent arbitration award of extra money to general practitioners and the recommendations of the Working Party on remuneration have done something to ensure that doctors have more time and should be able to develop more efficiently organized forms of practice by which they may secure better working conditions generally. But, at best, only a few steps have been taken; that is, however, our traditional way, and we may well hope that before long there will be further progress in the same direction.

III. THE SCOPE OF GENERAL PRACTICE

In any consideration of the training and working conditions of general practitioners it is essential to define what should be the scope of general practice.

The general practitioner should be the family doctor in the fullest sense in which that expression can be used. In Britain he has been gradually displaced over the years from that position by a lack on his part of positive adaptation to the organizational needs of medical progress, and by passive acceptance of further and further encroachments on his province by the clinic system and the growth of specialism, the latter being recently intensified by the introduction of the National Health Service. Concurrently, his status in the view of the public, of his specialist colleagues, and even of himself is said to have diminished. Inversely has the status of the consultant increased. However justifiable this last-mentioned development may at one time have been, it is now not infrequently, Ogilvie (1952) suggests, a change in status without change in stature.

If there has been so serious a diminution in the status of the general practitioner then it is clear that what is required is a new faith in general practice by general practitioners. They must stake out their claim and hold it. They see the patient first—or should do—and patients must be directed from them to the specialist in hospital, or at the clinic; but only as and when the practitioner considers that necessary. This may seem to be leaving for the specialist the role of a mere technician. But by yielding up to the general practitioner territory they have taken from him specialists should lose nothing in technical skill; and from the consequent closer association with the family doctor they should very definitely gain in knowledge of the patient as a whole.

Almost always in this country the patient first consults the general practitioner. To define the scope of general practice it may be useful to consider what the general practitioner can and should do for the patient. He should always—unless in very trivial cases—take an adequate history. The importance of good history-taking for purposes of diagnosis and treatment is recognized, but in general practice it has, if possible, even more importance than in hospitals; the patient must feel he is being taken seriously from the start, and the doctor, who is to decide the relative importance in diagnosis and treatment of all causative factors, including emotional and social ones, must necessarily precede his examination by a full and wide appreciation of the "whole" patient. Physical examination must be supplemented by special diagnostic measures as indicated. A diagnosis and appropriate treatment should then be possible for the vast majority of patients. The treatment should, wherever possible and appropriate, include all prophylactic, curative, and rehabilitative measures.

When the general practitioner is unable to arrive at a diagnosis or to give appropriate treatment—that is, when specialist assistance is required—he should seek aid through the hospital and specialist service. Such aid should not necessarily involve the help of a clinical specialist. Often the general practitioner should be able, by the use of specialist laboratory facilities, *x*-ray examination, etc., to make the diagnosis. Similarly, he should be able in appropriate cases to use all specialist and community resources of treatment. When it is necessary to consult a clinical specialist—and this is a decision for the general practitioner—by reference to a hospital or by domiciliary consultation, the principle should, wherever possible, be observed of the patient's illness being interpreted to him by the general practitioner. Whatever treatment is necessary in such circumstances should be given by, or at least in association with, the general practitioner. The specialist should not "take over" a patient unless that cannot be helped, as, for example, when the practitioner lives too far away from hospital. This principle suggests free access for general practitioners to beds where their patients are under specialist care. These observations refer to the whole clinical field.

There are in this country a certain number of general practitioners who prefer not to practise obstetrics, but the more this tendency is limited the better. No better opportunity will afford itself to a family doctor to establish a relationship of confidence and understanding than when he looks after a woman before and during the birth of her child, in the period before her return to normal duties, and when he guides her in the earliest care of her baby. The later care of the child in health and sickness should put the seal of trust on the relationship already developed. None of this work should be beyond the skill of the general practitioner making full use of the assistance available to him from all other sources. Indeed, the term "family doctor" becomes a ludicrous misnomer when these duties are relegated in the first instance to the specialist.

The position of surgery calls for special comment. Apart from the now few isolated districts in this country where surgical emergencies cannot await specialist assistance and must be done by the general practitioner, major surgery will rightly have little place in the work of the general practitioner. The practice of surgery is not incompatible with general practice; but, for efficiency, it involves certain prerequisites not likely in Britain to be at all common. Exceptions would be where a doctor has had specialist training and qualifications in surgery and holds a current part-time surgical appointment in hospital. In general, surgery by general practitioners should be limited to the more straightforward minor procedures.

Preventive Medicine

A vital role for the general practitioner, and one in which he has unique opportunities, is in the practice of preventive medicine and health education. A great many vague generalities are to-day being talked on this subject. We read that the great need of the general practitioner of the future is that his heart should be in preventive medicine, or other words to the same effect. Such an approach to the problem of preventive medicine in general practice is not likely to appeal to or convince the average general practitioner. Nor is it indeed sound. It would be unrealistic to think of the general practitioner as ever being mainly occupied in giving advice to well people. Since most of those who consult him are ill people who wish to be made well "quickly, safely, and cheaply," that must always be the practitioner's main interest and object. His heart should be—and fortunately usually is—in clinical medicine. And the good general practitioner has been practising preventive medicine every hour of his long day from time immemorial. Is it to be wondered at, then, that he is puzzled, and perhaps a little resentful, when he is told that he must in future accept responsibility for prevention of disease and for health education?

Would it not be more fruitful of results to tell him the truth—that the potentialities of what he has been doing in this field are only now being realized, and try to show him that by making full use of all community resources he could do even better? "The great physicians of all times have understood and have followed the principle that the practice of medicine is not simply an exercise in diagnostic acumen, nor a test of therapeutic skill, but requires a complete understanding of an individual as a person who is a member of a family, and who lives in an environment that has a profound influence, for better or for worse, upon his health. They have also understood and followed the principle that he is entitled to the benefits of preventive medicine as an essential part of his medical care" (Smillie, 1952a). There are welcome signs of this attitude being adopted, more so perhaps in the United States than here.

In a discussion on "The Future of Public Health" at the Johns Hopkins School of Hygiene, which I was privileged to attend, one of the principal speakers asserted that the future of public health lay in the development of medical care schemes which would ensure for the patients the services of a really good physician who was alive to the preventive aspects of medicine and who would strive hard to educate his patients in health matters. The control of communicable diseases, sewerage problems, and water supplies were all very necessary in their day and were still of paramount importance in certain more backward

countries. The future of public health in countries like the United States should be in making use of modern scientific advances for the benefit of individuals; and the only person who could really influence the public was the personal physician.

This new orientation is well expressed by Hilleboe (1952): "Clinical medicine is becoming increasingly aware of its role as a social instrument, and public health practice is perceiving more keenly the problems of the individual in his relation to the family and community in which he lives and works." The American Public Health Association's Subcommittee on Medical Care (1949c) states that "effective preventive service requires prompt, comprehensive, and continued personal care as well as community service of the kind traditionally associated with public health activity." I was interested to learn of two well-known medical schools where an internist had been appointed as professor of preventive medicine in the teaching of undergraduates. This seems to me another example of the same trend of thought. (Postgraduate teaching for those contemplating a career in administrative public health is an entirely different matter.) One of these professors told me that he felt much more able to interest his students in the social aspects of medicine through his ordinary ward teaching and by means of his home care scheme than by more formal instruction. The same view is well put by Smillie (1952b): "Preventive medicine must be thoroughly incorporated in clinical medicine and not be presented as a special block of knowledge which is to be added to the foundation. Preventive medicine is the mortar and cement that intermingles with the other foundation stones, binding the whole together, and giving it strength."

Personal preventive medicine, as opposed to community preventive medicine, may be considered under the following heads:

(1) The promotion of health. The general practitioner is uniquely well placed to advise on how individual good health may be maintained and on the general principles of healthy living. He can also do much in the course of his work in the special fields of antenatal and post-natal care, and infant and child welfare.

(2) The primary prevention of specific diseases by immunization and vaccination. No one has the same opportunities or influence as the general practitioner to persuade the public of the value of such measures.

(3) The control of asymptomatic disease, by multiphasic screening, including miniature radiography and other forms of mass investigation—assuming for the moment the desirability of multiphasic screening. With his knowledge of the patient's make-up and background, the general practitioner, more than any other doctor, is able to interpret to the patient the results of mass inquiry, without which such investigation can result in much harm.

(4) The secondary prevention of disease: by limiting progress; by preventing relapses, recurrences, sequelae, and disability; and by ensuring rehabilitation. This is an already well-worked field in general practice.

It will surely be obvious that the good general practitioner has been practising preventive medicine under all these heads. Admittedly it is only recently, and to a very limited extent, that he has done work in connexion with mass investigation, which in Britain is so far limited to radiography.

The general practitioner has a very special place also in mental hygiene. He is ideally situated to deal with many of the vast number of emotional problems in his patients. Indeed, it is clear that an adequate number of specialists to cope with these is outside the realm of reality. As a family doctor he comes to know many secrets from his patients about husbands, wives, and children; and he has to lend a sympathetic ear to the problems arising out of the strains and stresses of everyday life and work. Knowing intimately the family, home, and environment, and with a long experience of similar problems, the general practitioner is uniquely placed to advise such troubled patients.

IV. SOME PRESENT-DAY NEEDS IN BRITISH GENERAL PRACTICE

The main needs of the general practitioner to-day are: (1) adequate time to do his work efficiently; (2) facilities to practise medicine in the way in which he has been taught, including his own accommodation, equipment, and staff, and access to special diagnostic and therapeutic services at hospital or elsewhere; (3) some useful form of attachment to a hospital; and (4) regular and appropriate postgraduate training.

The Report of the President's Commission on the Health Needs of the Nation (1952d) laid down certain principles to be used as a guide in approaching their health problem in the United States. It is interesting that these included the statement that everyone should have a personal physician (family doctor), and that "the physician should have access to proper facilities and equipment, affiliation on some basis with a hospital, and the help of trained personnel." And one of their recommendations for general physicians was that "educational programs for the undergraduate, graduate, and postgraduate student be planned to provide the general physician with the best possible basic training and with continuous education throughout his professional life; and that hospitals and professional groups explore ways of extending appropriate hospital affiliation to all general physicians" (family doctors).

The Time Factor

This factor must depend on the number of patients a doctor has to attend and the way in which his work is organized, and, where appropriate, delegated to nursing, technical, or clerical assistants. The recommendations of the Report of the Working Party on the Distribution of Remuneration among General Practitioners (1952), which are now in operation, are designed to make entry into practice easier, to stimulate the formation of partnerships, and to reduce the permitted maximum number of patients a doctor can have on his list. These recommendations should go at least a considerable way towards achieving their object. Time may also be gained by a better distribution of patients among doctors.

In addition to administrative measures, general practitioners could try by individual or group effort to improve the distribution of patients. Those with smaller lists should be encouraged to see the very real possibilities of gaining new patients in a perfectly ethical way by offering a better and more attractive service.

There are evidences in Scotland of a few practices in which the patients are offered service manifestly above the average, and where growth has in consequence taken place to a very obvious extent without any lessening of ethical standards. It is very definitely not suggested that this result is the outcome of the doctors concerned putting "all their goods in the shop window." These practices are well organized, staffed, and equipped, and allow the doctors more time and adequate facilities for strictly professional work. The College of General Practitioners might well lay down standards for their members as to size of practices, equipment, etc. As an academic and educational body they would not be concerned with negotiations to secure the implementation of these recommendations: that could be done according to existing practice.

Diagnostic and Therapeutic Facilities

In American practice there may at times be overuse of such special facilities as a result of the doctor's own action or from demand by the patient. But there is no doubt whatever that the American general practitioner, perhaps mainly from force of circumstances, knows a great deal about the use of such facilities and can, in consequence, do many things for his patient which would not otherwise be possible or might at least be greatly delayed. I saw repeated examples of this as a result of studying case papers in the Johns Hopkins Medical Care Clinic. The American

general practitioner is naturally surprised that his British colleagues do not employ such measures in general practice. Three American observers in a recent report to the American Medical Association went so far as to write of the general practitioner in Britain: "He seems destined to a routine life which does not offer the necessary facilities to practise good medicine and which fails utterly to offer the professional incentives which lead to continued growth of the physician" (Diehl *et al.*, 1950b).

Hospital Appointments for General Practitioners

The excellent report on this subject by the Scottish Health Services Council (1952) points the way. If its recommendations are not fulfilled and are left to the fate of so many other valuable reports in the past, an opportunity for a reform of the first magnitude in our health services will have been lost. Unfortunately there are many concerned who are opposed to the idea of introducing general practitioners to hospitals. On the practitioners' own side there is far from whole-hearted support. To the American practitioner this would seem incomprehensible. He is convinced of his need of hospital privileges, and the American Academy of General Practice has had perhaps its greatest appeal to practitioners through its success in opening more hospital doors to them.

In the British general hospital, the "unit" system with its hierarchical arrangement of medical staff—specialists, trainee specialists, and interns—seems to hold little place for the general practitioner, and he has come to accept that position. It must be agreed that to have a useful function in one of these units a general practitioner would require to have had recent and very considerable specialist training and experience. This prerequisite is in fact possessed by the registrars, for whom consultant rank is not available. If they were enabled to enter general practice on a part-time basis there is no reason why they could not indefinitely hold their own in specialized knowledge and technique; and as their experience of general practice grew they would make a contribution to the hospital service which would be of inestimable value to their specialist colleagues and the patients. At the same time such doctors could become general practitioners of a very high order. To those who find difficulty in believing such a suggestion to be practicable the answers are simple. First, it has been done in this country in the recent past, even by doctors who rose to positions of pre-eminence in the hospital world and who in some cases achieved professorial status in the universities. Secondly, it is the experience of the morning spent in hospital work which enables the specialist in his outside practice to cope with private patients in the afternoon—not the other way round; so why should a doctor who devotes the rest of his day to general practice be incapable of performing his specialist duties in hospital in the morning?

Registrars at present going into general practice probably often become located where the chances of early reappointment to hospital on a part-time basis are far from promising. Hospitals should seek to retain such doctors on a part-time basis rather than part completely with their services; and an effort should then be made by some agency to find a local general practitioner who wants part-time help in his work from an assistant with a view to partnership. It would be surprising if such arrangements proved difficult to effect if the effort were made by some appropriate person engaged in promoting general-practitioner interests through local medical committees or otherwise.

Many general practitioners, perhaps through no fault of their own, are now of little potential use to the hospital service. Their unsuitability and unwillingness to undertake hospital work must not be allowed to prejudice the whole future of general practice. The absorption of general practitioners into the hospital service must necessarily be a slow process, and there will be more than enough willing candidates for the available places. The important point is that a start should be made now to find a reasonable number of openings for those already in practice, and that arrangements should be made—and here lies the main hope of success—for as many as possible of the coming generation of general practitioners to have hospital attachments suited to their qualifications and experience.

Postgraduate Training

Regular and appropriate postgraduate education is essential. The best method of keeping up to date is, of course, by means of a hospital attachment. There are, however, certain needs which cannot be met even in that way, and there will always be practitioners who cannot be found a place in hospital. For such it is essential to have a satisfactory system of postgraduate training. This should be based on the medical schools, and should last throughout each doctor's professional life. This attitude already exists in many American schools. In the Bingham Associates Program of Postgraduate Medical Education it states: "It is our belief that a primary responsibility of a medical school is to help practising physicians fulfil their duty of giving patients the best possible medical care" (*Bull. Tufts Coll.*, 1951). It is too narrow a conception to think in terms merely of refresher courses. These must be available, and in such form as to provide a continuing appeal to the practitioner. But it is essential also to think in terms of the total needs of the doctor in general practice. The College of General Practitioners should interpret these needs to the medical schools. Such stimulation as can be provided by research must be utilized, apart from its obvious value in more direct ways. Library facilities, local medical societies, and indeed anything which has a bearing on the subject of postgraduate education, should have the active assistance of the medical schools.

There are, I believe, quite a number of general practitioners—many of whom are capable doctors—who regard the sort of reforms advocated in the Cohen Report as unnecessary. A reasonable postgraduate experience, such as a year's internship before entering practice, is, they feel, enough for a doctor who maintains his interest in medicine and in the welfare of his patients. Some of these critics have maintained their own efficiency by efforts beyond the capacity of most. They are justly proud of their attainments and jealous of the good name of general practice. The Cohen Report argues that "the fulfilment of its recommendations will ease the lot of the general practitioner by raising his status in the eyes of the profession and the public, by stimulating his interest in the progress of the art and science of Medicine, and by providing him with the means of maintaining and refreshing his knowledge and skill and so of pursuing his practice with the pleasure and satisfaction that result from efficiency" (British Medical Association, 1950c). It is certainly difficult to see how general practitioners can expect to be regarded as the most important section of the profession—as they should be—unless they are prepared to undergo at least as serious a preliminary preparation as their specialist colleagues.

The Future Entrant to General Practice

An effort must be made to recruit to general practice as many as possible of the best types of young doctors. The difficulties of getting established in general practice which appeared at the outset of the National Health Service must have deterred many doctors from this career. Concurrently, there were apparent attractions towards specialism which, perhaps fortunately, have proved deceptive. More should be done to show medical students the attractions of general practice. In the United States I came across one country general practitioner who lectures every year to students in the University of Maryland. He told me that at these lectures he just tells the students simply what he does in his country practice and gives illustrations of the sort of experience he has and the features of a doctor's life in the country that appeal to him. I learned from several sources that his lectures have proved very popular indeed. The College of General Practitioners could help through medical schools to provide authoritative information about earnings, conditions

of work, and the interest general practice provides to the right kind of doctor. Requisite standards of equipment, accommodation, and staffing should be taught to students by someone of undoubted authority in the field of general practice. If exact information on these topics were known to all young doctors the standard would rise as they entered practice and influenced their seniors.

Health Centres

Experimental health centres such as are now ready and those about to be constructed may well provide useful indications for future policy. It might be worth while at least to experiment with centres designed with the aim of providing practitioners not only with full diagnostic and therapeutic facilities but also with intimate association with specialist work. The diagnostic and therapeutic facilities at present available in health centres are generally speaking of the simplest type. Such a new type of centre might go further towards meeting the needs of the present-day practitioner. Moreover, buildings of the same size as those presently contemplated could serve a much larger number of doctors and thus be more economical. It would seem possible also in this way to bring the benefits of group practice to many rural areas, except where distances are very great. At the Rip Van Winkle Clinic at Hudson, N.Y., for example, two practices, 5 and 10 miles respectively from the centre, form an integral part of the group.

Centres of the type described could be planned somewhat on the lines of the medical group centres of the Health Insurance Plan of Greater New York. Doctors could continue to practise from their existing accommodation and be associated with their group centre. It is unlikely that any financial association between the doctors would at first be possible, but that should not be an insuperable difficulty. Diagnostic and therapeutic facilities would either be available at the centre itself or, where appropriate, they would be readily obtainable through an associated centre or elsewhere. The appropriate staff of specialists would work in the centre on a part-time basis; at least some of the remainder of their time would have to be devoted to hospital ward work. It might be possible to link a number of subsidiary centres of an even less expensive type with a major centre. In some cases major centres could well be established at existing out-patient departments of hospitals; in any case, a link with hospital would be necessary, directly or indirectly, for each centre or group of centres.

This may seem merely to be a plan for building out-patient departments, sometimes in physical isolation from the hospitals themselves. So far as buildings are concerned that is probably true. But the essence of the scheme has yet to be added: it is the presence at these centres of the family doctor. Not only would the family doctor have direct use of diagnostic and therapeutic facilities and specialist advice on request, but he would himself be a member of the staff. He might consult at the centre at certain times, but he would also have a much more intimate relationship with his specialist colleagues than he has at present with out-patient department staff. The specialists would be seeing patients for family doctors in a group—a relatively limited number, since certain specialists would be allocated to each group. Like the family doctors, the specialists would come, as members of a group, to know their patients as persons and to appreciate them against their home background, and would be enabled to take their share of preventive and social medical responsibilities. Such a scheme at least not only holds out promise of providing the family doctor with the opportunity of practising preventive medicine better than he can do at present and of employing to the full for the benefit of his patients the clinical skills he has acquired and could develop, but it would enable the specialist to limit his work to cases of real difficulty and at the same time to see important aspects of medicine not now open to him.

There can be little doubt that in groups of this type the family doctor could deal on an ambulatory basis with many patients who at present are admitted to hospital. And a further number could be treated in their own homes by the family doctor, backed by specialist facilities and advice. Under present conditions both specialist and family doctor naturally expect the patient to be taken over by the hospital and specialist service if any diagnostic and therapeutic measures of the type now available only in hospital are required. Under the scheme suggested it would be incumbent on both specialist and doctor to use their group resources to the full before seeking to have the patient admitted to hospital. And the family doctor would himself be accustomed to and capable of carrying out a far wider range of work; so that he could do more on his own, apart from what further efforts he could make under specialist direction.

Not only would this method of group practice lessen hospital costs, but it might help to solve the medical manpower difficulties of hospital and family practice. There are to-day too many registrars in hospitals: they do not wish to leave hospital work, and, in any case, cannot easily enter general practice. Some of these doctors might be employed as specialists in such a scheme, while others might be attracted to general practice under group conditions. Lastly, they could have a part in both camps and practise a specialty and general practice. On the family doctor side there would be scope to develop skill in a specialty and eventually, if desired, to practise it partly or exclusively. It is not merely desirable, but essential, if the level of family doctor practice is to be raised, to secure hospital experience for the general practitioner. It will be difficult to achieve and may never be possible for all, but group practice offers a solution that could be a means of providing on a very large scale an association with the methods and practice of specialism outside the actual hospitals.

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ULCERATIVE COLITIS
WITH REPORT OF A CASE

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It is the purpose of this paper to review some of the literature on ulcerative colitis, and to present the case report of a patient with this disease in whom a successful outcome was obtained by psychotherapeutic means.

Review of Literature

Murray (1930a) investigated the life histories and mental attitudes of 12 patients suffering from ulcerative colitis, and found a close association in time between the emergence of a difficult emotional situation and the onset of symptoms. Mental conflicts concerned with marriage were more commonly found than other types of situations which might evoke anxiety. Murray felt that the outstanding trait in colitis patients, besides fearfulness, was their emotional immaturity, and stressed the childish elements in the make-up of his patients. In his seven male patients the onset of symptoms was associated with the conflict between the mother attachment and the desire for marriage. Of the five female patients in his series, three were involved in marriages of a significant nature, the husbands being obvious father-substitutes, one was engaged but could not marry on account of her colitis, and the fifth was unapproachable on the subject of marriage. In a later publication Murray (1930b) dealt with the analysis of a patient with ulcerative colitis and pointed to the fact that the character and sexuality of his patient corresponded quite closely to the so-called anal level described by Freud, and the masochistic and sadistic components which are so generally associated with anal temperament were very conspicuous in this patient.

In 1936 Sullivan drew attention to the long-recognized association of emotion and diarrhoea, and pointed out that psychotherapy had been astonishingly successful in the treatment of ulcerative colitis. Bargen *et al.* (1939) discussed pregnancy associated with ulcerative colitis in a series of 17 women sufferers with colitis who had 18 deliveries and 4 miscarriages among them. They concluded that the effect of pregnancy on ulcerative colitis was variable. In 1942 Daniels, in a review of 14 cases of ulcerative colitis, was of the opinion that these patients were apt to be too dependent on some member of the family, usually the mother, and conflict developed in situations threatening this dependence, especially engagement and marriage. The emotional conflict in these patients was held responsible for the appearance of colitis symptoms. He found childbirth another frequent precipitating factor.

Lindemann (1945), in a review of 45 patients with ulcerative colitis, maintained that various forms of bereavement were the most important precipitating factors in the illness, and for 26 of the 45 patients a close time relationship existed between the loss of an important person and the onset of the illness. He felt that rewarding patterns of social interaction seemed not to be indigenous to these patients, and that this state of affairs became conspicuous only when a key person on whom the patient was dependent and from whom he had borrowed patterns of interaction was removed from the "social field." He warned against deep exploration in the psychiatric handling of these cases, and recommended a superficial supportive therapy, during which the patient could identify with the therapist, and in fact imitate him in order to achieve new patterns of conduct.

In 1946 West reported three cases of ulcerative colitis in which the symptoms greatly improved after superficial psychotherapy. One of the patients subsequently passed into a psychotic state. Crohn (1947) pointed to the strong association between the stress of marriage, pregnancy, parturition, and the onset or relapse of ulcerative colitis, and indicated the onerous responsibility borne by the physician whose advice is sought regarding marriage and maternity for those of his patients suffering from ulcerative colitis.

In 1948 Daniels attempted to show how ulcerative colitis fitted into the present concept of psychosomatic disease, and pointed out that it had proved to be amenable to psychotherapy when other treatments had failed to bring results. He maintained that somewhat over 75% of sufferers had emotional conflict as a primary causative factor, but he was of the opinion that the emotional factors did not represent the "whole reason" for the condition. Kirsner *et al.* (1948) reviewed the clinical course of 100 patients suffering from chronic non-specific ulcerative colitis. They found that emotional stress, infections of the upper respiratory tract, and physical fatigue, in that order, were most often associated with the recurrences of symptoms.

Meyer *et al.* (1948) presented evidence which could possibly elucidate the psychosomatic link in ulcerative colitis in terms more definite than merely a dysfunction of the sympathetic and parasympathetic systems. In their study of the stools of patients with ulcerative colitis they demonstrated that the enzyme lysozyme was present in a higher concentration than in the stools of normal individuals. They found, too, that concomitant with clinical improvement the lysozyme titre in the stools fell. These facts and the experimental production of ulcerations in the small and large intestines of the dog by oral lysozyme administration suggested to them that lysozyme may be the chemical agent initiating the local lesions of ulcerative colitis. They assumed two stages in the pathogenesis of the disease: (1) removal of the surface mucus with dissolution of the mucous cells, and (2) necrosis of the denuded tissue by proteolytic enzymes presumably furnished by micro-organisms. They felt that the reason for localized overproduction of the enzyme by the mucosal cells, in the disease, was obscure.

In 1949 Lindemann drew attention to the fact that in some patients the disappearance of colitis symptoms is associated with the appearance of a psychotic illness, and that when the psychosis passes the colitis symptoms reappear. Mahoney *et al.* (1949), in a study of 20 patients with ulcerative colitis, found numerous neurotic traits in their subjects, and indicated that most of these traits existed long before the development of the evidence of ulcerative colitis, and that therefore these individuals were either overtly or potentially neurotic prior to the development of the bowel symptoms. Their study indicated, further, that there was a major abnormal parent–child relationship in the early lives of patients suffering from ulcerative colitis. They maintained that none of the personality traits found in colitis patients, when taken alone, were specific for the disease.

In April, 1949, Stewart also drew attention to the fairly typical history of emotional problems which seem to play a part in the pathogenesis of the disease. He pointed out that in the case histories and psychiatric investigations of patients with ulcerative colitis the precipitating factors and the basic personalities were often found to be similar, and he confirmed the fact that these patients give evidence of the presence of neurotic disturbances before the onset of their somatic illness. In the basic personality pattern he stressed their extreme dependence, emotional immaturity, subservient yet subversive attitude to domination, their overt passivity, and their high intelligence. He advocated a reassuring form of psychotherapy, in which dependence on the therapist is fostered, to be replaced by the gradual development of independence.

Maine and O'Neill (1949) presented the case report of a young girl with ulcerative colitis to show how psychological rehabilitation had been followed by disappearance of symptoms and maintenance of good health. They pointed out that the mother's personality made it inevitable that any aggressive feeling or activity on the part of the patient

would be met not only with maternal suppression but with a strong emotional response from the mother, leading to feelings of guilt in the daughter. Further, they indicated that the mother's possessive attitude fostered the patient's dependence upon her and discouraged any attempt at the establishment of an independent life.

In 1950 Glass, Pugh, Grace, and Wolf published the result of further work on lysozyme, which Meyer *et al.* (1948) had previously felt might be the factor initiating the local lesions of ulcerative colitis. They treated human gastric and colonic mucus with lysozyme, and concluded that lysozyme did not exert a lytic action on human gastric and colonic mucus *in vitro*. They admitted, however, that their experiments did not preclude the fact that lysozyme in physiological concentration may actually be capable of destroying or initiating destruction of mucosal cells.

Later in 1950 Grace, Wolf, and Wolff, from their observations of the large bowel in four fistulous subjects, showed that feeling states characterized by anger and resentment were associated with hyperfunction of the colon. This hyperfunction was manifested by hyperaemia, engorgement, hypermotility, and hypersecretion of mucus and of the enzyme lysozyme. They observed that hyperfunction of the colon resulted in increased fragility of the colonic mucosa, and that sustained feelings of anger and resentment associated with sustained hyperfunction of the colon resulted in submucosal bleeding and ulceration.

Lindemann (1950), in the presentation of a case of ulcerative colitis in a man aged 27, drew attention to the morbid relationship which had developed between the patient and his mother. He felt that in this patient, as in some others having abnormal bowel movements, the transition from an impulse to its execution was blocked, and that the man had a marked poverty of expression.

In September, 1950, Tumen and Cohn reported their experience with six patients regarding the influence of pregnancy on the development and the course of ulcerative colitis. In three patients the disease began during or towards the end of pregnancy, and in each of the other three pregnancy occurred during a remission, but failed to bring about reactivation of colitis. They point out that all had had poor relations with their parents, notably their mothers.

In November, 1950, in a report on 173 cases of ulcerative colitis, Paulley was impressed by a similarity in the case history and personality of many of his patients. He found them to be excessively dependent and parent-controlled, usually in respect of the mother. He found that the precipitating factors in the onset of the disease and in the relapses were almost always to be found in the emotional field and in interpersonal relations inside the family.

In December, 1950, Gray *et al.*, in their studies of lysozyme in the stools of patients with ulcerative colitis, failed to observe clinical improvement following prolonged inhibition of faecal lysozyme by the oral administration of a detergent ("aerosol OT"). These authors believed that this raised some doubt concerning the significance of lysozyme in the pathogenesis of the disease, but they emphasized, however, that the inhibition of lysozyme in the faeces by detergents does not necessarily reflect inactivation of the enzyme within the mucosal cells of the colon.

In January, 1951, Almy, in a report of experimental studies on the irritable colon, demonstrated that when both healthy persons and patients with irritable colon are under stress induced by experimental stimuli the sigmoid colon may show engorgement and disturbances in motility coincident with periods of emotional tension. He concluded that in most instances irritable colon was a bodily change accompanying emotional conflict in response to environmental stress.

In March, 1951, Groen and Bastiaans reported on 29 cases of ulcerative colitis observed during the period from 1939 to 1949 and treated by psychotherapeutic measures alone. They stressed the efficiency of superficial supportive psychotherapy.

In May, 1951, a committee on psychosomatic relationships in gastro-enterology under the chairmanship of Dr. Stewart Wolf (1951) reported that, as in the case of most bodily organs and organ systems, the gastro-intestinal tract showed significant changes in form and function in association with life situations which the individual consciously or unconsciously interpreted as threatening. The committee considered the relevance of these changes to the occurrence of structural disease of the viscera to be still incomplete, but maintained that a gathering body of data indicated that the changes may be of first-grade importance in the pathogenesis of such disorders as peptic ulcer and ulcerative colitis. Although at first altogether functional and transitory, the changes may, when unduly sustained, lead to structural damage and disease.

Grace, Wolf, and Wolff (1951) published a study of direct observations made on exposed segments of colon of four fistulous human subjects, and included indirect measurements made on a variety of intact healthy subjects, on subjects with diarrhoea and constipation, and also on 19 subjects with ulcerative colitis. They concluded that life situations provocative of abject fear and dejection were associated with hypofunction of most of the large intestine, and that life situations provocative of conflict, with feelings of anger, resentment, and hostility, or of anxiety and apprehension, were found to be associated with hyperfunction of the colon. They viewed ulcerative colitis as a stress disorder, and were of the opinion that a constructive physician–patient relationship was of the greatest benefit to the patient receiving treatment, and that favourable results in treatment were not obtained without such a relationship. They found the patient with ulcerative colitis to be characteristically an outwardly calm, superficially peaceful individual of more than usual dependence. On probing beneath this calm exterior it became apparent that this outwardly placid person was "sitting on a powder keg" of intense hostility, resentment, and guilt.

Psychogenetic Features

As can be seen from the above review of some of the recently published work, a distinct personality type in sufferers from ulcerative colitis has not been uncovered, but a few personality facets common to almost all patients with colitis have been revealed. Arising out of their observations, most writers have stressed the following characteristic features in their patients: (1) their immaturity and childishness; (2) their extreme dependence and passiveness; (3) the strong parent– (or substitute–) patient relationship, with its suppressed resentment and guilt; (4) their poverty of expression; and (5) their above-average intelligence.

Likewise in dealing with the precipitating environmental factors there is not unanimity, but workers have emphasized the importance of: (1) the marriage situation, with its demand for maturity and independence from parents, and with its responsibilities; (2) pregnancy and parturition, with their attendant stress; and (3) the loss of security, especially that pertaining to the loss of another person of emotional significance.

Case Report

In this report the psychiatric aspect of a case of ulcerative colitis is presented. The interplay of the major personality features and precipitating environmental factors outlined above are illustrated. The patient responded well to psychotherapy, remained symptom-free for two years despite many stressful situations, and then relapsed to a considerable degree in the wake of a minor incident. After five weeks of psychotherapy her symptoms again disappeared, and at the time of preparation of this report she had been well for 16 months.

A housewife aged 35 was admitted to the medical wards of the Johannesburg General Hospital on November 3, 1949, under the care of Dr. M. M. Suzman, with the complaint of recurrent attacks of diarrhoea with blood and mucus in the stools, of 11 years' duration.

The first attack, which lasted a few weeks, took place in August, 1938. The symptoms reappeared in January, 1939, and lasted for 12 months. During this period she passed between 25 and 30 stools on some days, and at one stage weighed only 65 lb. (29.5 kg.). In 1942 mild symptoms of colitis reappeared, but they lasted only a few weeks. In December, 1947, the symptoms again appeared, and, apart from a few remissions lasting some months, the colitis progressed until the time of admission. At that stage stools were frequent, up to 10 daily, and contained blood and mucus. There were fever, the temperature reaching 101.6° F. (38.7° C.) on occasions, colicky abdominal pains, fatigue, and debility, and a fall in weight from 136 to 105 lb. (61.7 to 47.6 kg.) over a period of three months.

Physical examination was essentially negative, apart from the state of undernutrition and generalized abdominal tenderness. Sigmoidoscopy revealed the presence of two bleeding ulcers in the lower colon. The appearance was consistent with a diagnosis of ulcerative colitis. Repeated stool examinations failed to reveal parasites or pathogenic or aberrant bacteria. A blood count showed: haemoglobin, 12 g.%; erythrocytes, 4,300,000; leucocytes, 8,400 per c.mm. The sedimentation rate was 31 mm. in one hour (Wintrobe). Gastric analysis revealed a low acid curve.

There was no record of the medication given in the months before admission to hospital, but according to the patient it had been extensive. In the hospital, medication consisted of the administration of 15 g. of aureomycin over a period of 10 days, a bismuth mixture, compound vitamin-B tablets, and phenobarbitone, ½ gr. (32 mg.) thrice daily during the same period. As no improvement followed, psychiatric investigation was started.

Psychiatric Investigation

Interviews of an hour each, two or three times a week, began on November 14 and continued for 10 weeks. The patient was born in New Zealand. Her mother was a Jewess, and her father a Gentile. He had been injured during the 1914–18 war, was a nervous and ineffectual person, and died in his early forties when the patient was 11 years old. Her mother, aged 68, was alive and well, and had always been a capable and domineering person, being the main financial support of the family during the patient's childhood; she was a school-teacher by profession. The patient had one sister, seven years her senior, who was a school-teacher in New Zealand.

The patient completed her secondary schooling and became a sales lady. At the age of 21 she migrated to South Africa with her mother, but her sister did not accompany them. Both the patient and her mother obtained employment in the same firm, and both had held senior positions for some years. Until the time of her marriage at the age of 33 she and her mother shared an apartment. Her past medical history was not remarkable.

Stress and Symptoms

Her symptoms of ulcerative colitis first appeared at the age of 24, following a proposal of marriage which she refused, ostensibly on the grounds of religious differences. She now feels that she refused the proposal because she was anxious about leaving her mother. The symptoms lasted about 12 months.

Four years later the symptoms returned. This episode began a few days after the arrival in South Africa of her sister, who came to pay her mother a visit. Within a few days of her sister's departure for New Zealand the symptoms subsided.

Five years later, at the age of 33, the symptoms recurred. This coincided with her husband's proposal of marriage. Many months elapsed before she finally married him, during which time the symptoms were severe. There was a remission during the weeks prior to the marriage, but on the second day of the honeymoon the colitis reappeared, and necessitated an early return to Johannesburg and her mother. During the next two years, until the time of her admission to hospital in November, 1949, the symptoms of ulcerative colitis had continued, with only short remissions.

She described her marriage as a happy one, and this was confirmed by her husband, who was of the same age and who appeared to be understanding, pleasant, and co-operative. They both claimed that the sexual aspect of the marriage was satisfactory. They devoted a great amount of time to the patient's mother and to the husband's parents, spending each day of the week with either one or the other. The relations between the husband and his mother-in-law were very strained, and he strongly resented her domination of, and interference in, his wife's affairs, but seldom spoke about it for fear of upsetting the patient.

Psychotherapy and Progress

The whole psychotherapeutic approach was one of sympathetic understanding and support. The concepts of psychogenesis and psychosomatic disease were explained to her, and efforts were made to establish a sound rapport and to correlate the onset of symptoms chronologically with stress situations. The aim was to foster emotional dependence upon the therapy situation initially, and then to wean her of that gradually. The central theme of most of the interviews was her hostile–dependent relationship with her mother, and she eventually expressed resentment freely. After about four weeks her symptoms subsided, and there were only minor relapses during the next six weeks, at which time she would herself try to correlate the symptoms with emotional stress.

She was discharged from hospital in January, 1950, 10 weeks after the beginning of the psychiatric investigation. She was then passing one well-formed stool a day, without blood or mucus.

Progress after Discharge

Within the first few weeks after going home the symptoms threatened to return on a few occasions. This was shown by a softer consistency and an increased number of stools. She immediately communicated with me, sometimes by telephone, and after a short discussion of the immediately preceding significant social events the stools returned to normal. These events were wholly concerned with her mother.

From April 7, 1950, until June 13, 1952, she remained completely free of symptoms. During this time she had given birth to her first child, her mother had died of a coronary thrombosis, her father-in-law had died, and her mother-in-law had come to live with her; and in December, 1951, she became pregnant for the second time.

She had seen me at three-monthly intervals at my request, apart from two interviews which she asked for at the time of her mother's death.

The Relapse

On June 13, 1952, when her symptoms had been absent for over two years, and when she was in the last trimester of her second pregnancy, there was a relapse. Initially mild, within two weeks she was having 10 stools a day, accompanied by blood and mucus. Out-patient interviews were resumed for six weeks. By the fifth week of therapy she was again symptom-free, and has remained so for 16 months. Her second child is 15 months old.

During the week prior to the beginning of the symptoms in June, 1952, I had asked the patient to meet another woman suffering from ulcerative colitis, in an attempt to show her that psychotherapy had a place in the treatment of her condition. My patient became too interested and involved in the solving of the other person's difficulties, and, unknown to me, saw her twice more during the same week. The day after the third meeting she received a letter from her sister in New Zealand discussing the proposed wording of the plaque to be erected to the memory

of their mother. The wording suggested was "To live in the hearts of those we love is not to die." This had tremendous emotional significance for the patient, whose feelings of guilt became overwhelming. Next day the symptoms began.

Psychosomatic Assessment

The major personality features in cases of ulcerative colitis described by other authors are easily recognizable in this patient. She was emotionally immature, particularly in her relationship with a dominant and possessive mother, and the keynote of that relationship was the hostile–dependence which evoked a considerable degree of guilt. Her intelligence was well above average.

Environmental stress situations immediately preceded the onset of symptoms on each occasion. The situations were associated with marriage, proposed marriage, or with a threat to the security of her emotional dependence on her mother, such as the visit of her sister in 1942. It was felt that her desire for marriage and emancipation from her mother's domination was in conflict with her basic personality pattern.

The resentment, and emotional tension resulting from her conflict, apparently manifested in disturbances in the function and ultimately the structure of the lower bowel, as has been described by other authors.

This case report seems to strengthen the plea for psychiatric investigation in patients with ulcerative colitis.

Summary

The literature on the psychosomatic aspects of ulcerative colitis has been reviewed.

The report of a case of ulcerative colitis is presented in which the patient displayed disturbances in interpersonal relationships, characterized by emotional immaturity, guilt, dependence, and resentment towards a dominating mother. The stressful situations evoking the disturbances were associated with marriage, proposed marriage, and situations threatening the security of the patient's dependence.

The major personality features and the precipitating environmental factors in the report conform to those stressed by other authors.

It is felt that this case report strengthens the plea for psychiatric investigation in patients with ulcerative colitis.

I wish to record my thanks to Dr. M. M. Suzman, specialist physician on the staff of the Johannesburg General Hospital, for his constant encouragement and guidance, both in the handling of this case and in the preparation of this article, and to Dr. Stanley Cobb, psychiatrist-in-chief, Massachusetts General Hospital, for his most helpful suggestions regarding the review of the literature.

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ELECTROLYTE IMBALANCE IN TUBERCULOUS MENINGITIS

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Mestrezat (1912) first focused attention on the diagnostic value of the chloride content of the cerebrospinal fluid (C.S.F.) in tuberculous meningitis, and he and other workers (Mestrezat, 1924; Greenfield and Carmichael, 1925; Foord and Forsyth, 1933) have all laid great stress on the value of a low C.S.F. chloride in the diagnosis of this disease. Merritt and Fremont-Smith (1937) observed a correlation between the chloride contents of the C.S.F. and plasma, and found a lowered concentration of chloride in the C.S.F. in any condition in which the plasma chloride concentration was low. As a low C.S.F. chloride associated with a low plasma chloride is often found in purulent meningitis, in intracranial disease, and in any condition causing vomiting, the occurrence of a low C.S.F. chloride in tuberculous meningitis cannot be regarded as being specific.

The use of streptomycin in the treatment of tuberculous meningitis has made possible the long-term study of the hypochloraemia and other electrolyte disturbances, of which a lowered C.S.F. chloride concentration is a manifestation. Rapoport *et al.* (1951) studied three children aged between 2 and 3 years by load-clearance techniques one week, two weeks, and three months respectively before death, when the patients whose food intake was poor were more or less comatose and having mild convulsions, but were not vomiting. The effects of loads of hypertonic saline, ammonium chloride, potassium chloride, and sodium thiosulphate were studied in these three children and one control. These workers concluded that, because the concentration of sodium and chloride in the urine did not fall to minimal amounts when the levels in the plasma were low, there was some "disturbance in renal electrolyte control," probably located in the proximal tubule of the kidney. At post-mortem examination the kidneys of these children were normal macroscopically and microscopically.

Further studies on the electrolyte disturbance in tuberculous meningitis were made by Harrison, Finberg, and Fleishman (1952). They investigated 16 children, finding that plasma concentrations of sodium and chloride were reduced, but that no consistent change in the potassium occurred. They found the sodium concentration in red blood cells and skeletal muscle to be increased, and the potassium to be normal in the former and reduced in the latter. Although they concluded that a disturbance governing ion equilibrium existed in these cases, no definite hypotheses on the causation were advanced.

It is conceivable that successful therapy against these electrolyte disturbances may complement specific therapy in tuberculous meningitis and assist recovery.

In the present investigation the electrolyte patterns of children with tuberculous meningitis have been related to their clinical conditions. Cases showing abnormal patterns have been followed for long periods, and the effects of intravenous injections of hypertonic saline and potassium salts orally have been studied.

Material

Nineteen patients with tuberculous meningitis and two with miliary tuberculosis only have been studied in this investigation. Their ages ranged from 1 to 13 years. Thirteen of these were receiving streptomycin by intrathecal and intramuscular routes, and one of these, who had gross internal hydrocephalus, was also receiving "purified protein derivative" (P.P.D.) intrathecally. Five patients who were improving had finished their course of intrathecal treatment but were still receiving streptomycin intramuscularly, and the two with miliary tuberculosis only were receiving the same. One patient was on the point of discharge and was receiving no treatment. Four, all in a poor general condition with an electrolyte disturbance, were given loading doses of saline intravenously. They were all vomiting at the time and were receiving streptomycin intramuscularly and intrathecally. Two of these who were still in the same condition were given potassium salts orally. All these patients were under treatment in the Streptomycin Unit of this department. Hypertonic saline was given to two cases in the general wards as controls for the saline-loading investigations.

Procedure

Blood was collected from the 21 patients at various stages of the disease, and the plasma CO_2 content, plasma or serum chloride, and serum sodium concentrations were determined. Urine was collected at the same time and the urine chloride content estimated. The estimations of various electrolytes in plasma or serum were repeated in seven children with hypochloraemia at intervals varying from 6 to 164 days after the initial investigations.

Infusions of hypertonic saline were given to four patients with hypochloraemia who were in the active stages of the disease. The loading dose of saline was given intravenously as a 15% (w/v) solution in amounts calculated to bring the plasma chloride back within the normal range, assuming that the Cl ion is mainly extracellular and that the extracellular compartment is approximately 25% of the body weight. Two controls received an arbitrary dose of sodium chloride. Three of the patients and the two controls were given 30–40 ml. of water every half-hour for three to four hours before the load and one and a half to two hours after it. One patient was given N/5 saline by mouth in doses of 30 ml. every half-hour for four and a half hours before the load and for one and a half hours afterwards. Urine was collected for a period before the hypertonic saline injection and for one and a half to two hours afterwards: the volume was noted and the sodium and chloride concentrations were estimated. Samples of blood for estimations were collected before the hypertonic saline injection and at intervals afterwards.

To test the hypothesis that these children might be suffering from a potassium deficiency two children were given potassium orally in amounts equal to an arbitrarily chosen deficit of one-quarter of their total body potassium. The potassium was given in divided doses over a period of five and four days respectively as a mixture of the citrate and chloride in a ratio similar to the ratio of bicarbonate to chloride in the extracellular fluid. This was done to avoid, so far as possible, any secondary effects on the acid-base state. In both these cases the diet was checked so that potassium intake did not suffer large fluctuations. Urine was collected during the four days before administration, during the time potassium was given, and for a period of four days afterwards.

All cases in this study were receiving *para*-aminosalicylic acid in the form of the sodium salt. The dosage was always approximately 0.5 g./kg., and it has been calculated that each case received around 60 mg./kg./day of sodium in this way.

Analytical Methods

Chloride was estimated on 0.2 ml. of plasma by Sendroy's (1937) method. Plasma CO_2 content was estimated on plasma which had been collected and centrifuged under liquid paraffin in either the volumetric or manometric apparatus of Van Slyke (Van Slyke, 1917; Van Slyke and Neill, 1924). Sodium was precipitated from a serum filtrate as sodium zinc uranyl acetate according to the modification of Butterworth (1951). The method of Jacobs and Hoffman (1931) was used for the determination of serum potassium. All the urine potassium determinations and many of the sodium estimations were made on an E.E.L. flame photometer.

Results

1. Electrolyte Patterns in Blood and Urine

Details of 21 cases are given in Table I. The cerebral condition was assessed in most cases by the presence or absence of papilloedema. Although many cases had air

TABLE I.—*Data of 19 Cases of Tuberculous Meningitis and 2 Cases of Miliary Tuberculosis*

Case No.	Age (Years)	Sex	Blood (mEq/l.)			Urine (mEq/l.)	Duration of Illness from Onset	Cerebral Condition	Vomiting in Preceding Fortnight	Period of Treatment
			Plasma Cl	Plasma CO_2 Content	Serum Na	Cl				
1	9	F	89	30	131	24	13 days	Papilloedema	++	6 days
2	10	F	92	31	135	57	33 „	Normal	++	23 „
3	1¾	M	82	34	140	18	4 weeks	Papilloedema	+++	4 „
4	5	M	87	29	138	98	4 months	Papilloedema and hydrocephalus	+	3 months (P.P.D.)
5	8	M	92	28	137	—	26 days	Papilloedema	++	5 days
6	11	F	83	31	132	34	15 „	„	+	8 „
7	2	M	80	23	133	123	16 „	Normal	++	2 „
8	5	F	88	27	135	37	15 „	Papilloedema	+	3 „
9	3½	M	89·5	26	124	56	11 „	Normal	+	3 „
10	9½	F	91	20·5	138	55	23 „	„	+	2 „
11	13	M	102	25	142	140	8½ months	Normal	—	7 months (completed for 1½ months)
12	3½	M	101	26	143	98	12 „	„	—	11 months
13	1½	M	98	24	144	—	8 „	„	—	6 months (completed for 2 months)
14	13	F	101	25	150	130	28 „	„	—	25 „ („ „ 3 „)
15	1¾	M	101	23	146	116	3½ „	„	—	3 „ („ „ 3 weeks)
16	1½	F	99	24	141	50	3 „	„	—	3 months
17	10	F	99	28	141	63	4 „	„	—	3½ „
18	7½	M	99	25	138	135	5½ „	„	—	5 months (completed for 1 month)
19	7	M	102	28	146	134	9 „	„	—	6 months (all treatment completed for 2 months)
20	6	F	99	23	—	117	6 days	„	+	3 days
21	5	F	97	22	142	137	4 weeks	„	+	4 „

+=Occasional vomiting. ++=Vomiting once or twice a day. +++=Vomiting more than twice a day.

studies, only one showed definite hydrocephalus, most of the patients with papilloedema being too ill for air studies to be done.

Ten patients (Cases 1–10) had a plasma chloride concentration of 92 mEq/l. or less, whereas nine patients with tuberculous meningitis (Cases 11–19) and two with miliary tuberculosis (Cases 20 and 21) had plasma chloride values within the normal range (95–106 mEq/l.). The serum sodium concentrations also showed a definite difference, although this was not so marked as in the case of the chloride values. Although only one child in the group with hypochloraemia had a serum sodium as high as 140 mEq/l., all but one of the other group had values above this figure. In nine of the children with hypochloraemia the chloride content of one specimen of urine (collected at the same time as the blood) was estimated. In all of them there were more than minimal amounts of chloride (18 mEq/l. or more) in the urine, in the presence of low concentrations of chloride in the plasma. The occurrence of serious vomiting in the fortnight preceding these investigations is confined to the group with an abnormal electrolyte pattern, as is abnormality in the cerebral condition (Cases 1–10). On the other hand, all 11 children with a normal electrolyte pattern had a normal cerebral condition (Cases 11–21). Nine of them had been treated for periods of three months or longer and had had no recent vomiting. The remaining two children in this group had been ill for a shorter time. They were vomiting occasionally but had miliary tuberculosis only and no meningitis (Cases 20 and 21).

2. Changes in the Electrolyte Pattern with Changes in Clinical Condition

Table II gives the results of determinations of electrolytes in serum or plasma, together with any changes in cerebral condition and vomiting, in seven cases of hypochloraemia,

TABLE II.—*Follow-up Blood Electrolytes in Seven Cases*

Case No.	Plasma Cl (mEq/L)	Plasma CO_2 Content (mEq/L)	Serum Na (mEq/L)	Urine Cl (mEq/L)	Cerebral Condition	Vomiting in Preceding 2 Weeks	Days between Investigations
1	89	30	131	24	Papilloedema	++	58
	93	26	140	84	Slight papilloedema	−	106
	97	25·5	147	−	Normal	+	
2	92	31	135	57	Normal	++	58
	95	25	143 (?)	35	,,	−	106
	97	29	145	−	,,	−	
3	82	34	140	18	Papilloedema	+++	32
	87	30	143	59	,,	−	120
	97	25·4	140	−	Papilloedema and hydrocephalus	−	
	87	29	138	98	Papilloedema and hydrocephalus	+	41
	89	31	137	100	,, ,,	+	116
	97	26	139	−	,, ,,	−	
6	83	31	132	34	Papilloedema	+	6
	89	33	143 (?)	24	,,	+	100
	95	31	144	−	Normal	−	
8	88	27	135	37	Papilloedema	+	22
	88	34·5	137	31	,,	++	
9	89·5	26	124	56	Normal	+	14
	88	27	141 (?)	116	,,	+	55
	94	27	140	−	,,	−	

in none of which had there been any persistent attempt to adjust the electrolyte disturbances. The second set of determinations (in Cases 3, 4, and 6) were just prior to the load of hypertonic saline, but this load is unlikely to have affected the subsequent determinations, which were done after intervals of at least 64 days. Similarly, it is unlikely that the third set of determinations (in Case 9) were affected by potassium therapy, which finished 50 days before.

A progressive improvement in the electrolyte values is seen in all children except Case 8. The increase in the concentration of chloride and sodium in the serum or plasma coincided with improvement both in the general condition and in the state of the meningitis, and simultaneously there was a diminution in vomiting. Case 3 was developing hydrocephalus during the investigations, but the meningitis healed and his general condition improved and vomiting ceased. Similarly, in Case 4 there was an improvement in the electrolyte pattern at the third estimation, when vomiting had ceased, but hydrocephalus was still present. One patient (Case 8) was extremely ill. She did not respond to treatment, deteriorated rapidly, and died three days after the second set of determinations recorded in Table II.

3. Load of Hypertonic Saline

The injection of hypertonic saline produced a rise in the concentration of plasma chloride and serum sodium in all cases at the second estimation, which was made within one hour of the injection. A third estimation 27–30 hours later was made in two cases of tuberculous meningitis (Cases 6 and 8) and one control. Case 8 was very ill and died a few days later. Homoeostasis must have been seriously disturbed, as very little urine was passed through the indwelling catheter for 174 minutes after the injection. In the other two (Cases 6 and Control 2) the serum chemistry returned to the pre-injection levels within 30 hours. Case 6 had a normal serum sodium, but a low plasma chloride, which after a transient rise returned to a low value, indicating an inability to maintain the plasma chloride at a level approaching normal (Table III).

TABLE III.—*Results of Sodium Chloride Loads (Electrolyte Levels)*

Case No.	Pre-injection Levels (mEq/l.)			Post-injection Levels (mEq/l.) Time after Injections in Hours							
	Na	Cl	CO_2	Time	Na	Cl	CO_2	Time	Na	Cl	CO_2
3	134	93	25	1·0	136	102	23	—	—	—	—
4	137	89	31	0·5	143	101	27	—	—	—	—
6	143	89	33	0·75	147	96·5	30	30	143	92	31
8	137	88	34·5	0·75	139	94	34	27	139	96	37
Control 1	149	96	26	0·5	150	105	23	—	—	—	—
Control 2	142	99·5	28·5	0·5	144	109	27	29	144	100	29

The basic excretion of chloride in mEq/min. during the pre-injection period was assumed to be the same throughout the whole study, and this amount was subtracted from the total excretion in any period. Table IV shows the

TABLE IV.—*Results of Sodium Chloride Loads (Excretion)*

Case No.	Hydration Prior to Injection	Weight in Kg.	Dose of 15% NaCl in ml.	Time of Study after Injection in Minutes	% Excreted in Period of Study	
					Na	Cl
3	N/5 saline	8·2	17	122	27	4·5
4	Water	15·0	35	162	17	18
6	,,	27·7	50	129	17	9
8	,,	18·6	30	174	0	0
Control 1	,,	24·1	40	228	21	11
,, 2	,,	22·7	35	177	64	47

percentage of the dose of sodium and chloride that was excreted in the four cases and two controls. The excretion of sodium and chloride during the pre-injection period in Case 3—hydrated with N/5 saline—was much higher than in any other cases, and there was little increase in the excretion of chloride after the hypertonic saline injection. Control 1 showed a response indistinguishable from that of Cases 4 and 6, whereas Control 2 excreted a much greater percentage of the injected dose in 177 minutes. In Case 8 the child was extremely ill and unconscious, and excreted none of the injected dose within 174 minutes. A few days later she became grossly oedematous and died.

4. Administration of Potassium

The effect of potassium administration on the plasma pattern and on the excretion of potassium in the urine of two children with tuberculous meningitis and hypochloraemia is shown in Figs. 1 (Case 6) and 2 (Case 9). Case 6 was given 143 mEq of potassium a day, and

excreted 74% of the ingested potassium during the five days of administration and the subsequent four days. About 26% of the dose was therefore retained, unless it was lost by vomiting. Case 9, on the other hand, received 109 mEq of potassium a day and excreted only 19% of the dose during the four days of administration and the subsequent four days. In this case the vomiting was less severe than in Case 6, and the return of the potassium excretion to pre-administration levels immediately after the four-day period suggests that 81% of the dose was retained. Both children had hypochloraemia at the time of this investigation, but in Case 9 the serum sodium was within normal range — namely, 139–144 mEq/l.—whereas in Case 6 it was low—namely, 133–144 mEq/l.—during the 12-day period. Further, the plasma chloride concentration in Case 9 increased from 88 to 92.5 mEq/l. during treatment, and at the end of the 12-day period had risen to 95 mEq/l. Thus potassium administration in the two cases of hypochloraemia resulted in retention of potassium and an improvement in the electrolyte pattern in the case with a normal serum sodium level, while it caused an insignificant retention of potassium and no change in the plasma pattern in the case with a low serum sodium level.

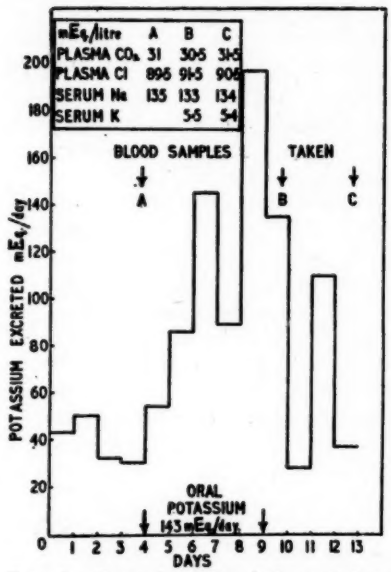

FIG. 1.—Case 6. Effect of potassium administration on the plasma pattern and the excretion of potassium.

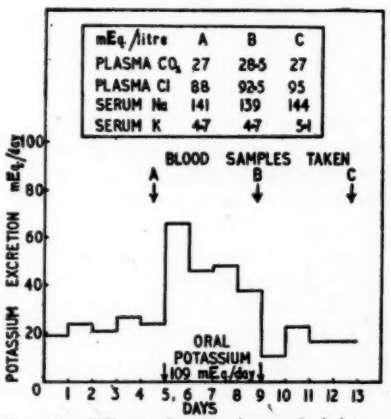

FIG. 2.—Effect of potassium administration in Case 9.

Discussion

This investigation shows, as was to be expected, that the occurrence of an abnormal electrolyte pattern in a group of children suffering from tuberculous meningitis was confined to those in whom the illness was of recent origin or in whom the cerebral condition was abnormal. On the other hand, children who had been under treatment for longer periods or who had miliary tuberculosis only did not show any abnormality in the electrolyte composition of the plasma. The clinical feature, however, which distinguished the two groups in the period preceding the collection of the blood was the food intake and the vomiting. The children with tuberculous meningitis and an abnormal electrolyte pattern had a low food intake and had been vomiting for two or more weeks before the initial estimation of the electrolyte content of the plasma. The importance of vomiting as the immediate cause of the electrolyte disturbance is further demonstrated by the fact that the most marked and most consistent of the changes was the hypochloraemia.

A direct effect of an abnormal cerebral condition on the causation of hyponatraemia and hypochloraemia becomes unlikely in view of the progress of Cases 3 and 4. In both these cases vomiting had ceased, but hydrocephalus was still present at the time that the electrolyte pattern had returned to normal.

In view of the suggestion by Rapoport *et al.* (1951) that defective kidney function accounts for the electrolyte disturbance in tuberculous meningitis, an attempt was made in the present investigation to assess the role of the kidneys. The experiments with the load of hypertonic saline were unfortunately inconclusive because of the different response of the two control cases, one of whom showed no difference from the response of the children with tuberculous meningitis.

Although it is realized that the estimation of the chloride content of one isolated specimen of urine may not give a true picture of the chloride excretion over 24 hours, it is thought that the presence of more than minimal amounts of chloride in the urine on more than one occasion in all the children with hypochloraemia is of significance. Such an occurrence might be due to a hypofunction of the electrolyte-regulating hormones of the adrenal cortex—that is, an Addisonian syndrome. A similar disturbance, however, is observed in potassium-deficient patients, and an experiment with potassium loads orally was planned to test this hypothesis. The retention of 81% of the potassium by a child with hypochloraemia and with a normal serum sodium resulting in a normal electrolyte pattern, and the retention of only 26% of the administered potassium by a child with a low serum sodium, suggests that in some cases at least there is a deficit of potassium and also that large doses of potassium cannot be retained in the presence of a sodium deficit and therefore cannot correct the electrolyte disturbance. It seems that the position is analogous to that in which, in the presence of a deficit of potassium, large amounts of saline do not restore the plasma pattern to normal until potassium is given as well.

Our present study suggests that vomiting and reduced food intake leading to a deficit of the main electrolyte ions Cl, Na, and K can explain the electrolyte disturbance in children with tuberculous meningitis. This study has not excluded the presence of a "disturbance in renal electrolyte control" (Rapoport *et al.*, 1951), neither has it excluded "a disturbance of the mechanisms governing ionic equilibrium between cells and extracellular fluid" (Harrison *et al.*, 1952). We think, however, that it is unnecessary to postulate that such disturbances exist, unless it can be proved that the observed abnormalities in electrolyte metabolism cannot be accounted for by the more simple phenomena of vomiting and reduced food intake.

Although this work is inconclusive, it seems to us that the maintenance of adequate electrolyte intake in the early stages of tuberculous meningitis may be an important factor in assisting these children to recovery.

Summary

The electrolyte disturbance in tuberculous meningitis has been studied. In a group of 19 children with tuberculous meningitis and 2 with miliary tuberculosis only, 10 were found to have an abnormal electrolyte pattern.

A correlation was found between the abnormal electrolyte pattern (hypochloraemia, hyponatraemia, and an increased CO_2-combining power) and the occurrence of serious vomiting.

The abnormal electrolyte pattern was not seen in children who had been treated for long periods, and it disappeared after cessation of vomiting, on improvement in the cerebral condition, and on increase of the oral intake to within normal limits.

Injections of hypertonic saline in four cases did not increase the plasma chloride permanently. Transient rises were noted.

Potassium as a mixture of chloride and citrate was administered to two children by mouth and balance studies were made. In one child with a normal serum sodium 81% of the potassium given was retained. In another child, who had a low serum sodium, only 26% was retained.

It is suggested that the electrolyte disturbances in tuberculous meningitis can be explained by the serious vomiting and prolonged low food intake in the early stages of the disease. The abnormality is not due to a deficiency of any one electrolyte, but is probably due to a combined deficit of sodium, chloride, and potassium. Ensurance of an adequate electrolyte intake may be an important contributory factor to the recovery of patients with tuberculous meningitis.

Thanks are due to Professor R. S. Illingworth for permission to study cases under his care, and to him and Professor H. A. Krebs, F.R.S., for helpful criticism in the preparation of this paper. We are indebted to the staff of the Biochemistry Laboratory, Royal Infirmary, Sheffield, for making many of the urine electrolyte investigations.

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CLINICAL AND CHEMICAL STUDIES IN HUMAN LACTATION

VII. THE EFFECT OF DIFFERENCES IN YIELD AND COMPOSITION OF MILK ON THE INFANT'S WEIGHT GAIN AND THE DURATION OF BREAST-FEEDING

BY

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Although it is recognized that there are individual differences in the yield and composition of milk, the practical effect of these differences in terms of successful breast-feeding has received almost no attention. In Sweden, Sydow (1952) investigated the relationship between the milk yield on the sixth post-partum day and the duration of breast-feeding, and found that if the sixth-day yield was under 300 ml. there was a considerably diminished chance of breast-feeding. This was an insensitive index, however, since only 25% of cases were in this low-yield group. Moreover, under "breast-feeding" were included those who were only partly breast-feeding, so that the overall figure of over 90% still breast-feeding at the end of two months, which is well in excess of any reported in this country, is difficult to interpret.

In an earlier study, Sydow (1944–5) gave an indirect indication of the effect of differences in fat content on the weight gain of the infant. Infants whose mothers donated to a milk bank milk which was stripped from the breast after feeding and therefore contained a high proportion of the fat gained less weight than those whose mothers gave milk which was removed before the feed and contained relatively little fat. The average weight gains were 765 ± 62 g. and 866 ± 42 g. a month respectively. Sydow states that the material was unsuitable for comparison, since the birth weights and ages of the infants were not taken into account, and claims no significance for the results.

Kon and Mawson (1950) found no relationship between the weight gain of the infant after the eighth week and the fat content of the milk; but the milk yield was not known and, moreover, their technique of manually expressing a single morning sample gives no accurate indication of the daily fat output, and no conclusions can be drawn from it.

Gunther and Stanier (1951) found a significant relationship between the amount by which the baby was below its birth weight on the eighth day, and the eighth-day milk volume, but none with the fat content of the milk. The interpretation of this finding is not simple, since the initial weight loss varies very widely and is not related to food intake.

The terms "lactation" and "breast-feeding" must be differentiated. Lactation is a largely automatic physiological function showing wide individual variation. Successful breast-feeding is obviously dependent in the first instance on adequate lactation, but the efficiency with which this basic capacity is exploited depends on such factors as a desire to breast-feed, social custom, intelligence, and general living conditions. It is, in many ways, a test of the capability and character of the mother.

The various circumstances which determine the difference between the number of women having successful lactation and the number who breast-feed successfully will be discussed in subsequent papers, but, in order that the significance of the figures presented here can be appreciated in their proper context, the "official" attitude towards breast-feeding in this community must be described, since the proportion of women breast-feeding can to some extent be influenced by pressure of opinion from doctors and health visitors.

In Aberdeen, preparation of the breast as recommended by Waller (1946) is not practised, although Waller's shields are sometimes used for the treatment of inverted nipples. In hospital, unless there are definite medical contraindications, or unless a woman has firmly stated her intention to bottle-feed, it is tacitly assumed that all women will breast-feed, and much care is taken and time spent encouraging the mother in the lying-in wards. Excess milk is manually expressed after feeds as a routine during the first four or five days. Engorgement of the breast is treated along orthodox lines, which include the use of oestrogens. If the puerperium is uncomplicated the mother remains in hospital for eight to ten days.

If breast-feeding is not fully established in hospital, and if the woman is anxious to persevere, she may be sent home partly bottle-feeding, but there is an increasing tendency, if lactation is obviously poor, to begin artificial feeding in hospital so that efficiency in this technique can be acquired in the security of the hospital rather than in the general turmoil of failing lactation at home. Complementary feeds are given to breast-fed infants in hospital at the ward sister's discretion. There are no rigid rules governing their use, but they are generally given after the third day if the baby is still losing weight or when, after feeding, it still appears

hungry and test weighing reveals that the intake of milk has been inadequate.

The mother is visited within 24 hours of leaving hospital by a health visitor of the maternity and child welfare service. Further visits are made, at least weekly, for the first four weeks, and less frequently thereafter, although they are made more often when necessary. Breast-feeding is encouraged, but when lactation is clearly inadequate full artificial feeding is usually agreed to be a more practical alternative than prolonged complementary feeding.

It is the general experience that the majority of women who make the change to bottle-feeding do so without consulting a health visitor. The Aberdeen general practitioner is frequently consulted, but is less enthusiastic than the health visitor about breast-feeding.

Method

All the women in this investigation were confined in the Aberdeen Maternity Hospital, and details of the progress of lactation and of the infant were recorded during the lying-in period. They included the birth weight and subsequent daily weights until discharge, and records of any complementary feeds. The weight gain in hospital was taken as the gain from the third to the seventh day, since the weight changes during the first three days are almost wholly unrelated to food intake. Information about subsequent progress until the end of the thirteenth week was obtained from the records kept by health visitors of the Maternity and Child Welfare Department. The follow-up was limited to the first three months, because mixed feeding is often introduced during the course of the fourth month, and the contribution of breast milk to the baby's total food intake is then unknown.

The duration of breast-feeding was taken to be the time, up to a maximum of 13 weeks, during which full breast-feeding was carried on. The addition of any complementary or supplementary feeding was taken to mark the end of breast-feeding.

The reason for the cessation of breast-feeding was obtained from the health visitor concerned. In many cases this rested on the mother's own story, which usually took the form of "the baby cried all night" or "he didn't seem satisfied," and all such instances, together with those where there was definite evidence of inadequate nutrition, such as falling weight, were classified together as "failure of lactation."

Of the 167 women whose milk was sampled on the seventh day of lactation 148 were followed up for 13 weeks, and in all of these information was available about the time full breast-feeding stopped and the reason (or presumed reason) for stopping. For the remaining 19, 16 of whom left Aberdeen, data were available for periods of less than 13 weeks.

Beyond the first month of life accurate weights of infants were available for only 83 who had attended child welfare clinics, and these weighings were often at irregular intervals. In order that weights at fixed intervals could be used for statistical analysis, weight curves were constructed for each infant, and the presumed weights at four weeks, eight weeks, and twelve weeks were read from the curve. Weights were recorded only while full breast-feeding was in progress, so that if, for example, breast-feeding had ceased at six weeks, only the weight at four weeks would be available from the curve. Extrapolation beyond the last recorded weight was not attempted.

The method of collection of the milk samples, and the chemical analyses, have been described in previous papers (Hytten, 1954a, I, II, III).

Results

In testing the relationship between seventh-day milk and the clinical data on breast-feeding and infant weight gain, the milk yield and the several constituents were each tested separately. Only the yield and the fat content were related to the clinical findings, and, since these are not related to each other, it seemed logical that a stronger relationship could be found by multiplying them to give the total fat output for 24 hours. In practical terms, a milk with a poor fat content might be clinically satisfactory if it were associated with a high yield, and, conversely, a high fat content might compensate for a low yield. This proved to be so, and total fat output has been used for most of the following results.

Weight Gain of the Infant in Hospital

In assessing the infant's progress in hospital, 10 cases were excluded—five because the weight was not recorded on the third day, and five because artificial feeding was used during the first week, when breast-feeding had been temporarily suspended because of sore or cracked nipples.

Fig. 1 shows, in the remaining 157 infants, the relationship between the seventh-day milk fat output and the weight gain of the infant from the third to the seventh day.

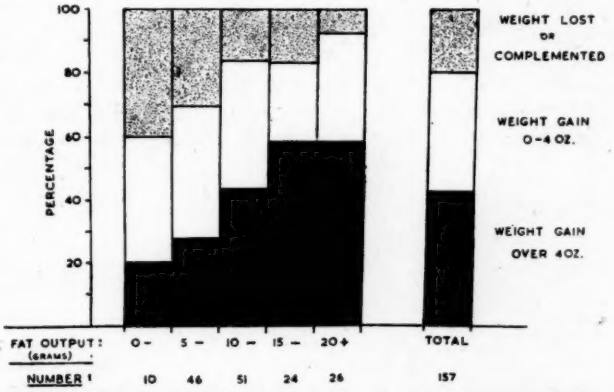

FIG. 1.—The relationship of the fat output in the seventh-day milk to the weight gain of the infant and the need for complementary feeding from the third to the seventh day.

In the group where the fat output was less than 5 g., 40% of the infants either lost weight or required complementary feeding, and only 20% gained more than 4 oz. (113 g.). With higher fat outputs the weight gains were correspondingly better, and in that group in which the fat output was 20 g. or more 58% of the infants gained more than 4 oz. and only 7.5% lost weight or required complementary feeding. There was a statistically significant difference between the amounts of fat in the milk of those infants requiring complementary feeds compared with the rest ($P<0.01$), but in the infants not having complementary feeds there was no significant correlation between the fat output and the infant's weight gain. This was partly due to the wide range of values for both weight gain and fat output and to the relatively small numbers, but there is also a contributory factor, which is best illustrated by the four cases in which the fat output was over 35 g. In this group one infant lost 2 oz. (57 g.); the other three gained only 1½, 2½, and 4 oz. (43, 71, and 113 g.), for the reason that where there was a gross excess of milk the infant had a full feed well before the breast was empty, and the remaining milk, which contained much of the fat, was expressed for the milk bank

Weight Gain During the First Three Months

The seventh-day fat output was related to the weight gain of the infant during the first four weeks ($P<0.01$), but not at later stages.* It must be pointed out, however, that the weight gain at eight and twelve weeks refers only to

*The regression equations were:

Ounces weight gain (3rd day–4 weeks)	$=25{\cdot}2+0{\cdot}50$ (Fat output) $\pm 0{\cdot}18$	in grammes)	$-0{\cdot}05$ (3rd day $\pm 0{\cdot}08$	weight in oz.)
Ounces weight gain (3rd day–8 weeks)	$=98{\cdot}2+0{\cdot}14$ $\pm 0{\cdot}34$	"	$-0{\cdot}35$ $\pm 0{\cdot}16$	"
Ounces weight gain (3rd day–12 weeks)	$=121{\cdot}4-0{\cdot}24$ $\pm 0{\cdot}61$	"	$-0{\cdot}22$ $\pm 0{\cdot}29$	"

those infants who were still breast-feeding at these stages, and by the eighth week the majority of infants whose mothers had a low fat output had ceased breast-feeding.

Duration of Breast-feeding

Of the 148 mothers for whom data are available up to the thirteenth week, 23 were excluded from this part of the study because breast-feeding had been discontinued for reasons clearly unrelated to the adequacy of lactation. Of these 23, 11 had cracked nipples or mastitis, 8 stopped because of vague ill-health, 2 refused to continue breast-feeding after leaving hospital, one wished to return to work, and in one case feeding was abandoned because of an acute illness of the baby.

Of the remaining 125, 64 (51.2%) stopped breast-feeding before the thirteenth week because of "failure of lactation." Fig. 2 shows the percentage of infants still being breast-fed at stages up to 13 weeks, in the five fat-output groups. In the group having the highest fat output (20 g. or more), 89% breast-fed for thirteen weeks. With lower fat outputs, correspondingly fewer women succeed in breast-feeding, and in those with the poorest fat output (less than 5 g.) only 18% breast-fed for thirteen weeks. The relationship between fat output and the duration of breast-feeding is statistically significant ($P<0.01$).

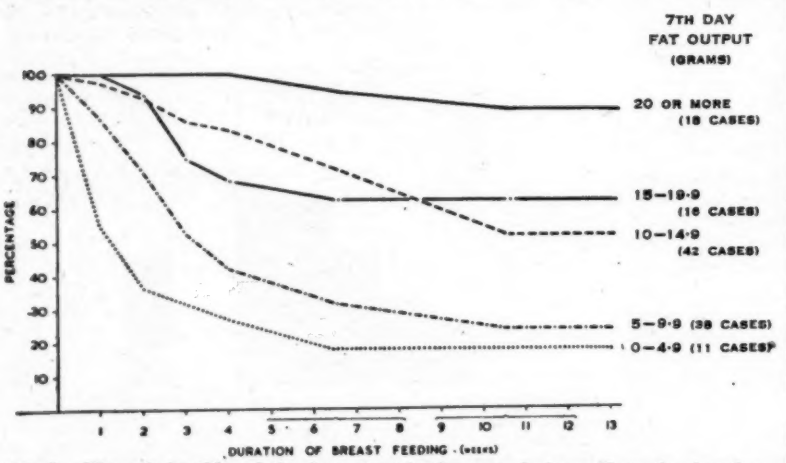

FIG. 2.—The relationship of the fat output in the seventh-day milk to the duration of breast-feeding.

It has been shown in a previous paper that yield and fat content on the seventh day are not related to each other (Hytten, 1954b, V), and Tables I and II demonstrate that both yield and fat content are associated separately with the duration of breast-feeding.

TABLE I.—*Relationship of 7th-Day Milk Yield to Duration of Breast-feeding*

	7th-day Milk Yield (ml.)			
	<300	300–449	450–599	600+
No. of cases	35	41	31	18
Proportion breast-feeding at 13 weeks	26%	46%	58%	78%

TABLE II.—*Relationship of Fat Content of 7th-Day Milk to Duration of Breast-feeding*

	7th-day Milk Fat Content (g./100 ml.)			
	<2·51	2·51–3·25	3·26–4·00	4·01+
No. of cases	28	50	32	15
Proportion breast-feeding at 13 weeks	36%	40%	62%	80%

Discussion

It has been suggested on somewhat slender evidence that breast-fed infants may suffer from deficiencies of certain amino-acids (Clements, 1949; Albanese, 1951); or of some vitamins (Jeans and Marriott, 1947; Naish 1948); but in everyday practice the adequacy of milk as an infant food is judged in terms of its calorie content. The baby who cries or who fails to gain weight because of hunger is the practical problem and the subject of this study.

It is held by some enthusiastic advocates of breast-feeding that almost all women can breast-feed if they want to, with the implication that failure is due to an unwillingness of the mother to make the effort. Jeans and Marriott (1947) make the categorical statement that breast-feeding "is possible at least for the first few months in over 85% of cases," and Illingworth (1953) states: "Another diagnosis which is commonly made by doctor, nurse, or mother—particularly the latter—is that the breast milk is too watery. *For practical purposes this diagnosis is always wrong.* At least, I have not yet seen such a case" (author's italics). In confirmation of this claim, Illingworth quotes the following authors who have published figures showing a very high incidence of breast-feeding. Yung-en Kao (1948) described an incidence of 95% at six months in a series of hospital out-patients at Mukden, and Richardson (1925) an incidence of 92.1% at one month in a district of New York. In neither instance is there any reason to believe that breast milk was necessarily the sole source of nourishment for the child. Read (1949) published a series of 480 women, of whom 98% were discharged from hospital breast-feeding on the twelfth day, but 15% were classified as "breast-feeding—poor," 26% as "breast-feeding—fair," and 46% of the babies had not regained their birth weight. There is no record of the breast-feeding performance after leaving hospital.

A belief in the universal ability to breast-feed is difficult to reconcile with the evidence of deficient lactation presented in this paper. It might be argued that the milk yield can readily be reduced by such emotions as antagonism to, or lack of enthusiasm for, breast-feeding, and to some extent this may be true. However, it has been previously shown (Hytten, 1954c) that the major source of variation in milk yield is in the gross differences which occur in the development of the breasts during pregnancy, and it is unlikely that such well-marked physical changes in the breast are due to emotional factors. Again, the fat content of the milk is closely associated with breast-feeding success, and there is no evidence that the percentage of fat can be altered at will. In fact, the level of fat content has been previously shown (Hytten, 1954b) to be remarkably stable after the first week of lactation.

The evidence strongly suggests, then, that "failure of lactation" is a real phenomenon, and that those women who produce less than 10 g. of fat on the seventh day are very unlikely to be able to breast-feed successfully. This group constitutes one-third of the cases in this series.

Although it is necessary to know the fat content of the milk in order to judge fully the adequacy of lactation, it is clear from Table I that yield alone is of considerable prognostic value. The seventh-day yield, calculated from test weighing the baby and measuring strippings from the breast, is a relatively simple clinical test, and of those women in this series who produced a pint (570 ml.) of milk or more on the seventh day 81% breast-fed for three months at least.

However, although the level of lactation is a major underlying influence in the success of breast-feeding, there are clearly other factors involved. For example, all women secreting more than 15 g. of fat on the seventh day probably had an adequate lactation, and yet 26% of them failed to continue breast-feeding for three months. These factors will be discussed in a future publication.

It has been shown previously (Hytten, 1954b) that such differences as occur in the lactose and protein contents of

the seventh-day milk are due to differences in the speed of maturation, and that in more mature milk the variation in these constituents has practically disappeared. In this study there were no differences in the success of lactation which were associated with the protein content of the seventh-day milk, so that the speed of maturation is apparently of no particular importance in this connexion. That is, milk which is slow to "come in" does not necessarily portend unsuccessful breast-feeding.

The rapidity with which women with poor lactation stop breast-feeding emphasizes the importance of studying human milk composition as early as possible in lactation, if the full range of variation is to be appreciated. Any investigation of human milk secreted after the second or third month of lactation would be carried out on a highly selected population. Those women with poor lactation would, of necessity, have abandoned breast-feeding, and although a considerable variation in milk composition may remain among the rest there will be little or no really poor milk discovered. This may, in part, be the basis for the widely held belief that variations in milk composition are unimportant.

Summary

The success of lactation, judged by the duration of breast-feeding and the weight gain of the baby, is shown for 167 subjects whose milk was analysed on the seventh post-partum day. Both milk yield and fat content were related to the clinical data. The total fat output had a stronger relationship than either.

There was a marked relationship between the seventh-day fat output and the baby's weight gain in hospital.

The breast-feeding history of 148 of these subjects was known until the 13th week. In 23, breast-feeding was terminated for reasons unconnected with the adequacy of lactation. In the remaining 125 there was a marked relationship between fat output on the seventh day and the duration of breast-feeding.

Accurate weights during the first three months of life were known for 83 of the infants, and, although there was a strong relationship between fat output and weight gain during the first month, there was none after this time. This effect is presumably due to the elimination of those infants initially fed on milk of low nutritive value, leaving at the breast only those for whom the milk was at least adequate.

I am grateful to Professor Dugald Baird and the staffs of the Midwifery Department and the Aberdeen Maternity Hospital and to the health visitors of the Maternity and Child Welfare Department for invaluable help; to Professor John Craig, of the Department of Child Health, and Dr. I. Leitch, of the Commonwealth Bureau of Animal Nutrition, Bucksburn, for criticism and advice; and to Mr. J. F. Scott for statistical assistance.

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CARCINOMA OF THE MIDDLE EAR

BY

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This report is concerned with carcinoma arising primarily in the epithelium of the middle-ear cavity or mastoid air cells. The disease is rare. We have been able to find only 120 cases in the literature, and even this figure is only approximate, as the accounts often include cases of growth arising in the external meatus. Risch and Lisa (1938) gave a full account of many previous case reports and a comprehensive bibliography. It is usually impossible to decide clinically whether one is dealing with a carcinoma of the tympanum or of the external meatus, but the former has some distinct features, illustrated by the following six cases.

Case 1

A married woman aged 62 was first seen in July, 1947, complaining of having had right-sided otorrhoea for five months and pain in the right side of the lower jaw for three months. She was found to have an incomplete right facial paralysis of the lower motor neurone type, induration in the inferior portion of the right parotid gland, granulation tissue deep in the meatus, and a blood-stained discharge. Malignant disease was suspected, and was confirmed by biopsy of the aural granulation tissue, which revealed "a well-differentiated squamous-cell carcinoma, almost completely keratinized." It was decided that irradiation should be the first means of treatment, and 8,200 r was given from August 18 to October 9 by teleradium (5-g. unit) and deep *x* rays.

On December 19 the temporal bone was explored through a post-aural incision. As the mastoid process and the middle ear were found to be largely replaced by tumour an extensive excision was performed. The facial nerve, although not identified, was removed with the tumour tissue, as the facial paralysis was later found to be complete. The dura and the temporo-mandibular joint were not involved. The pain disappeared after the operation, and the disabilities resulting from the facial paralysis became the patient's chief concern and were to some extent rectified by a right tarsorrhaphy and a fascial sling. There has been no evidence of recurrence.

Case 2

A man aged 44 was seen for the first time in November, 1951. He had suffered from bilateral otorrhoea for twenty years, but came for advice because of increasing deafness. Both middle ears were extensively damaged, but both were dry. A hearing-aid was prescribed. One month later he developed a right facial paralysis. Examination then showed granulations protruding through a large postero-superior perforation in the right drum. He complained of severe pain in the ear, but there was no mastoid tenderness. A right radical mastoidectomy was performed (post-aural approach) in the belief that this was a case of chronic infection with an acute exacerbation. A good deal of granulation tissue was found in the mastoid process and tympanum, together with much erosion and destruction of bone. The horizontal portion of the facial nerve was exposed. The wound was packed with bipp ribbon gauze

and left open, and a fortnight later, as the cavity appeared clean and was covered with healthy granulations, a skin graft was applied and the posterior incision closed.

Shortly after this operation the patient complained of increasingly severe pain in the ear. The cavity was dressed after a week, when much of the graft was found lying free in the cavity, and granulations covered the facial ridge. It was then felt by one of us (R. P.) that the abnormal course of the case was suggestive of a growth, and biopsy confirmed this suspicion, revealing "active squamous-cell carcinoma." The cavity was explored again and all diseased bone and muscle was excised, leaving the sigmoid sinus, jugular bulb, and parts of the membranous labyrinth exposed. The temporo-mandibular joint was opened, as the growth had invaded it and had also spread to the dura overlying the tegmen tympani. Permission to remove the pinna had not been obtained, and it was removed a week later. The material excised at this operation showed "a fairly well differentiated squamous-cell carcinoma with invasion of the temporal muscle, the facial nerve, and the temporal squame." A course of irradiation was given to the open wound, 5,455 r by deep *x* rays and teleradium (10-g. unit) over 55 days. The cavity appeared to heal well from the bottom, but the pain persisted. By July, 1952, he began to suffer from fits, and he died of an intracranial extension in September, 1952.

Case 3

A man aged 75 was first seen in February, 1952, having had severe left-sided earache and otorrhoea for four months. Both the pain and the discharge, which was blood-stained, had increased steadily and were associated with a recent increase in deafness. The pinna was displaced downwards and outwards by a brawny oedema over the mastoid process, and in the external meatus there was a bloody and foul-smelling discharge, whilst bare bone was palpable in the floor of the canal. A diagnosis of carcinoma of the tympanum was made on clinical grounds, and on March 17 the left mastoid was explored through a post-aural incision. The whole of the temporal bone lateral to the labyrinth capsule had been replaced by a growth, which was also invading the temporo-mandibular joint. A wide excision was performed. The operation was followed by a partial left facial paralysis of the lower motor neurone type. Material removed at operation was sent for microscopical examination and showed, "extensive invasion by squamous-cell carcinoma of the pinna, the parotid gland, and the mastoid process." He was then treated by a combination of deep *x* rays and teleradium (10-g. unit), and a total dose of 3,855 r over 36 days was given. The pain was unrelieved, although, as in Case 2, the operation cavity was left wide open. He died of coronary occlusion in June, 1952. Post-mortem examination revealed residual carcinoma in the petrous apex.

Case 4

A spinster aged 52 was referred by her doctor with a diagnosis of carcinoma of the right ear, for which a limited local excision had been performed nine months previously. She complained of severe and constant earache, and there had been three recent attacks of bleeding from the ear. The right external auditory canal was very stenosed and contained a thin and foul-smelling blood-stained discharge. There was a complete conductive deafness. In a smear of material taken blindly from the depths of the stenosed meatus carcinoma cells were found.

Accordingly, on February 11, 1952, the right temporal bone was explored through a post-aural incision. The epitympanic space and the posterior meatal wall were replaced by a growth, which was also spreading forwards into and above the temporo-mandibular joint, as well as deeply and anteriorly into the dura of the middle fossa. As much as could be reached of this growth was excised, and the anterior and superior walls of the cavity were coagulated by diathermy. The posterior bony wall of the cavity was covered with a Thiersch graft, a large meatal opening was fashioned after Ballance's method, and the wound was closed. The material obtained at operation was examined and showed "(1) no neoplastic change in the meatal skin, (2) invasion of the medial end of the meatal skin tube, and (3) active islands of squamous-cell carcinoma in the tegmen tympani." The patient was then treated by irradiation, receiving a total dose of 5,900 r in 69 days by a combination of teleradium (10-g. unit) and deep *x* rays. She died on November 11, 1952, from intracranial spread of the original lesion. The local pain was unrelieved by treatment.

Case 5

A married woman aged 68 was first seen in February, 1953, with a history of discharge from the left ear for many years. For the past year she had had pain in the left side of the face and head, and the discharge had become blood-stained. Examination showed signs of previous suppuration in the right ear. On the left side there was a partial facial paralysis, and granulations were growing out of the middle ear into the meatus. Because of the history and the clinical findings, some of this granulation tissue was removed for biopsy, and a squamous-cell carcinoma was revealed.

On March 10 the left temporal bone was explored through a post-aural incision. The mastoid portion of the bone and the whole tympanum had been replaced by tumour tissue, which did not, however, appear to have penetrated the dura. So far as possible, the growth was removed, and examination of the material obtained at operation showed: "(1) In one area there is evidence of chronic inflammation with lymphocytes and foam cells. There is an area of hyperplastic squamous epithelium loosely attached to this tissue. (2) Squamous-cell carcinoma with cornification. There are areas of fairly deep infiltration." After operation the patient was treated by a combination of teleradium (10-g. unit) and deep *x* rays, receiving a total dose of 5,560 r in 39 days. Pain was not a pre-operative feature of importance, and disappeared after treatment. There is still no evidence of recurrence, and the radical cavity is soundly epithelized. A slight facial palsy persists.

Case 6

A married woman aged 55 was first seen on January 12, 1954. She had suffered from left otorrhoea since childhood and from lumps below and anterior to the ear for six months. A fleshy polypus occupied the meatus, and there was a hard nodule the size of a pea in the pre-auricular region and a much larger mass in the subdigastric area. Biopsy of the polypus revealed an early squamous-cell carcinoma developing in granulation tissue. The patient was referred to the Radiotherapeutic Research Unit of the Hammersmith Hospital, and the ear was treated on the 8-million-volt linear accelerator. From February 1 to March 15 a dose of 5,820 r was given. The middle ear became dry and fibrotic in appearance and the pre-auricular gland disappeared. A very extensive block dissection of the left side of the neck was carried out on April 24. Nodes in the subdigastric area and others from behind the mastoid attachment of the sternomastoid muscle contained squamous-cell carcinoma. The patient left hospital on May 7.

Discussion

Clinical Features

Previous writers have emphasized certain points which are to be found in these cases.

1. Pain.—This was a feature in all of our cases, and in three of them was unrelieved by treatment. Furstenberg (1924) and Bowman (1940) believed that the pain was due to the pressure of the expanding tumour within a rigid bony framework. However, an expanding lesion like a cholesteatoma does not cause pain by its presence, although pain may occur when an acute infection supervenes. The

pre-operative pain in these cases may well be due to secondary infection, but the persisting post-operative pain, occurring even in a widely laid open cavity, is inexplicable. It cannot be due to direct involvement of the dura, as the dura over the temporal bone is not a site from which painful stimuli can be elicited (Wolff, 1948). Nevertheless, in Cases 2, 3, and 4, in which pain was a dominant symptom, the dura was invaded by the growth, whereas the pain disappeared after operation in Cases 1 and 5, in which there was no dural involvement. We are not prepared to offer any explanation of these observations. Pain is a common symptom in cancer, and its cause is often obscure.

2. Chronic Suppuration.—A history of genuine chronic suppuration was obtained in only two of our six cases. In the other cases the otorrhoea could be attributed to the presence of tumour rather than to pre-existing suppuration.

3. Facial Paralysis.—This was a presenting symptom in two cases, and was present but unnoticed by the patient in one case.

4. A Blood-stained Aural Discharge.—This was present in four out of the five cases.

5. Sequestration of Bone.—This was present in one case.

6. Post-aural Swelling.—This was present in one case.

7. Metastasis.—Neighbouring or distant metastasis has rarely been reported in the literature, but it occurred in Case 6. Whether the method of treatment adopted was the correct one remains to be seen, but the result so far has been satisfactory.

From our experience it seems that pain and the presence of a blood-stained discharge, particularly if there is also a facial palsy, are the most reliable indications of malignant disease in the middle ear. The diagnosis must be clinched by biopsy.

Cause of Death

The cause of death is usually given as malignant cachexia. In some cases invasion of the meninges leads to fatal intracranial complications. In others a fatal haemorrhage occurs from erosion of the jugular bulb or the carotid artery. Death from a distant metastasis has not been recorded.

In our series, one patient died from coronary occlusion and two from direct intracranial spread of the disease.

Treatment

In so far as so rare a disease can be said to have any settled mode of treatment, it would be a combination of surgery and radiotherapy. One of our cases received radiotherapy before surgery, whilst the others were treated by post-operative irradiation (at the Royal Cancer Hospital, London, under the direction of Dr. M. Lederman). The extent of the operation varied with the extent of the disease. As in all cancer surgery, no anatomical boundaries were respected, and no attempt was made to preserve any involved structure which could be excised.

For instance, in most cases the inner ear was removed in whole or in part; in two cases considerable portions of the capsule of the temporo-mandibular joint were excised; and in one case the pinna was sacrificed. When the region of the facial nerve was involved in growth no attempt to preserve the nerve was made at the expense of a skimped excision.

However, in Cases 2, 3, and 4, pursuing the disease anteriorly would have meant excision of the temporo-mandibular joint and the adjacent part of the base of the skull, with no certainty, even then, of reaching the limits of the growth. In the light of subsequent events, this is probably the course which should have been followed to give the patient the best possible chance, as it seems clear that radiotherapy is unavailing in growth so deeply buried in bone. In Case 3 the whole bony meatus and the parotid gland should perhaps also have been excised in order to comply with the essential requirements of tumour surgery. These are speculative suggestions, offered after reflecting on the clinical course of these few cases, and applying general surgical opinions which are commonly accepted. The tumours are not highly malignant, and distant metastasis is almost unknown. The problem, then, is entirely one of adequate local removal, and this seemingly applies particularly to the bone, as irradiation appears to be effective in controlling the soft-tissue invasion. Before embarking on any case a clear idea must be entertained of the possible directions of spread in the bone and a feasible means of excising these areas. Such excisions are not insurmountable technical problems, provided they are not presented suddenly in the course of an operation conceived in lesser terms.

Prognosis

The prognosis of middle-ear carcinoma is very poor indeed. Only one case is to be found in the literature in which the patient has survived for more than five years. In this series six cases are reported; one patient is alive and well six and a half years after coming under observation, and one other, treated a year ago, was also alive and without any evidence of recurrence at the time of writing. In both these cases the disease did not involve the dura, which is the factor enormously worsening the outlook.

Summary

Six cases of carcinoma of the middle ear are described. Suggestions for more radical surgical excision are offered.

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ANGULAR STOMATITIS AND ITS ASSOCIATION WITH ARTIFICIAL DENTURES

BY

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Angular stomatitis is seen by the general physician as evidence of nutritional (especially vitamin B) deficiency or of anaemia; but such patients rarely visit the dermatologist. Nevertheless, many patients suffering from angular stomatitis are seen in dermatological and dental departments, and few of them are found to be suffering from general nutritional disease. Most of these patients show a local infective cause for the condition or have some dental fault or both.

The series of patients reviewed in this paper were drawn from the dermatology department of the General Infirmary at Leeds, and the work was done in conjunction with the staff of the dental school.

The literature on the subject is vague; but Vickers (1949) made an important contribution, and his approach has been followed.

There appears to be little doubt that there are several aetiological factors, and in some cases more than one of these may be contributory, so that careful consideration of each particular patient is necessary if treatment is to be successful. Generally accepted aetiological factors include: (1) infection; (2) ariboflavinosis; (3) generalized seborrhoeic or flexural eczema; (4) sensitization to dental materials; and (5) malocclusion.

Infection

Angular stomatitis may occur as a manifestation of lues in the secondary or tertiary stages. Other infections, especially of the respiratory or gastro-intestinal tract, may also cause the condition, including moniliasis. In Case 14 attacks of angular stomatitis were coincidental with recurrent tonsillitis, and in Case 16 relapses always followed a common cold.

Ariboflavinosis

Although in this series ariboflavinosis does not seem to be important, this may be explained by the direction of such cases to general medical rather than dermatological clinics. Blood vitamin levels were not undertaken as a routine; but all patients were questioned closely with a view to establishing possible dietetic deficiency or finding evidence of a malabsorptive syndrome: Case 23 proved interesting in this respect. This patient suffered from Crohn's disease for many years, and her stomatitis cleared soon after operation for this condition and has not recurred. Her case was also interesting in that there appeared to be a familial tendency to angular stomatitis, as both her brother and her sister (Case 12) suffered from the condition, though neither gave any similar history suggestive of malabsorption.

Generalized Seborrhoeic or Flexural Eczema

Angular stomatitis often occurs as part of a generalized seborrhoeic or flexural eczema and clears or relapses with the general condition; but it may occur as the sole manifestation.

This condition involves more of the skin adjacent to the angles of the mouth than usual and proves very resistant to treatment and liable to relapse readily. An example of this type is Case 17, which proved extremely resistant to various local measures, including antibiotics, dental treatment, and to *x*-ray therapy, but cleared on the administration of ung. steroxin and had not relapsed six months later.

Sensitization to Denture Materials

Some patients become sensitized to the material of their dentures, and in such cases the condition usually clears with the substitution of a different denture material. In most instances of sensitivity to denture material an area of hyperaemia, and in some cases actual oedema of the underlying mucous membrane, is present; but in three patients (Cases 1, 6, and 11) there were no mucosal changes, although patch tests to denture material were positive. Further, 12 patients (Cases 4, 8, 12, 18, 21, 26, 28, 32, 36, 41, 43, and 45) with mucosal changes were negative to patch tests. It is noteworthy that acrylic dentures were concerned in all these cases except one. As a control, colleagues at the dental school examined 100 random cases in the prosthetics department, and in only one of these was there any definite mucosal lesion without accompanying angular stomatitis or complaint of soreness of the gums. These people had been wearing dentures for from one year to forty years.

Patch Testing

This means of investigation of the presence of sensitivity was used, the method followed being that of Vickers—namely, the application of scrapings from the patients' own dentures to the skin, held in place by adhesive plaster. In several instances positive patch-test reactions were delayed, and it would seem advisable to retain the material in position for at least 96 hours, with a preliminary reading at 48 hours. Cases 1, 2, 3, 24, 33, and 44 demonstrate this delayed reaction.

It might well be argued that these delayed positive reactions could be due to mechanical friction or chemical action; but a control series of 20 medical students failed to produce any such mechanical positive reaction even after a week.

Further, all cases were tested at the same time against clear acrylic and other denture materials, and all positive results were very definite, no possible mechanical positive reactions being obtained with the other materials.

There were, as is usual in most series of patch tests, some anomalous results, and one in particular (Case 7) proved interesting. This patient gave a positive patch reaction to vulcanite dentures in January, 1952, at 48 hours. There appears to be little doubt about this, as he was demonstrated to a class of medical students at the time as a good example of a positive reaction. New dentures were made for him in acrylic, and his angular stomatitis cleared rapidly. He happened to have retained his old dentures, and in March, 1953, the patch test was repeated and proved to be negative at 96 hours.

Another patient (Case 3), who gave a delayed positive patch reaction to acrylic scrapings from his own dentures, failed to reproduce this when tested against acrylic applied direct to the skin. (These pieces were specially made and processed for two, four, six, and eight hours respectively.)

Although the evidence here is slender it is possible that some physical or electrochemical factor is concerned with these reactions and that the presence of saliva may in some way be bound up with this.

Nature of the Sensitizing Material

Lain (1932) states that the substance probably responsible for the sensitivity in vulcanite is vermilion, but as this material is rapidly becoming obsolete it was decided to investigate only the newer and more fashionable acrylic materials. Naturally, it was decided first to investigate the colouring material; but the makers were unwilling to disclose its nature or to supply any for patch testing.

All patients were therefore patch-tested against coloured scrapings from their own dentures and clear acrylic scrapings. In only two cases (Nos. 6 and 46) was a positive result obtained to the coloured and a negative to the clear.

It was then decided to investigate a theory that sensitization is due to incomplete polymerization of monomer during the actual process of making the dental plates. This process consists in mixing liquid monomer and polymer powder into a dough, which is then heated in a mould, during which process the monomer polymerizes and the finished article results. This process probably depends on the presence of an organic peroxide or some such substance in the powder which acts as a source of free radicals which can initiate the polymerization of the added monomer. This reaction is slow at room temperature, but is nevertheless appreciable, since the mixture will set into a fairly hard material in a few days.

On heating, polymerization occurs more rapidly, the normal plate being processed at 100° C. for about six hours.

Since polymerization takes place slowly at room temperature it seems unlikely that any monomer would be present, at least on the surface, even in an under-processed plate, after it had been made for a few weeks. However, it is possible that monomer could be trapped in the rigid polymer material in positions remote from initiator molecules, and it might thus be unchanged.

It seemed that the theory might be tenable if the monomer was a primary irritant or sensitizer, or if appreciable differences could be demonstrated in the amount of monomer present in acrylic material processed in different ways.

To test the first point all patients were patch-tested as a routine with monomer when being tested against denture materials, and in addition a control series of students and nursing staff were also tested. In no case did a patch test to monomer give a positive result even after 96 hours. It would therefore seem that liquid monomer is neither a primary irritant nor a potent sensitizer.

TABLE I.—*Summary of Results*

Case No.	Age (Years)	Duration of Condition (Years)	Past Medical History	Worn at Night	Material of Dentures	Duration of Wearing (Years)	Mucosal Lesions	Patch Test Results	Ultimate Diagnosis	Treatment	Result
1	45	2/12	Nervous dyspepsia 6/12	No	Upper A. (6) Lower V. 20	20	No	Delayed + V.	Sensitivity to V.	A. Lowers remade	Improved, but not completely cleared
2	47	3	Cholecystectomy (stomatitis followed almost immediately)	Yes	A. (20), V. 2	20	Yes	+ A. (96 hrs.)	Sensitivity to A.	Remade. V. O.B. ½"	Improved, but relapsed. Had considerable temporo-mandibular arthritis
3	38	8	P.O.W. in Germany at onset. ? Vitamin deficiency	No	B.	14	,,	+ B., 1952. Delayed + A. (96 hrs.) 1953	Sensitivity to B. and A.	Remade Oralite	Improved; but relapsed
4	31	3	Low-grade hypochromic anaemia	Yes	A.	14 (New, 1)	,,	Neg. 96 hrs.	Malocclusion	O.B.	No change
5	72	2/12	Constitutional eczema 2 years	No	A.	2	Very minor only	Doubtful + A. 96 hrs.	Sensitivity and malocclusion	Remade V. O.B. 3/16"	Cleared rapidly
6	59	1/12	Constitutional eczema, 1949. Hysterectomy, 1942. Pruritus ani, 1946	,,	A.	17	No	+ A. Neg. clear A. and V.	Sensitivity to A.	Remade V. N.B.	Cleared
7	50	18/12	Nil relevant	Yes	V.	8	Yes	+ 48 hrs., 1952 Neg. 96 hrs., 1953	Sensitivity to V.	Remade A. O.B. 3/16"	,,
8	31	2	Perforated gastric ulcer 3 years ago	,,	V.	8	Slight only	Neg.	Malocclusion	O.B. 3/16"	,,
9	55	2	Nil relevant	No	V. 20, A. 2	20	No	,,	,,	Remade A. O.B. 3/16"	Improved
10	54	8	,, ,,	,,	A.	7	,,	,,	?	X rays 100 r ×3×28	Cleared
11	57	2/12	Psoriasis many years	,,	V.	7	,,	+ 48 hrs.	Sensitivity	Remade A. N.B.	Improved
12	48	10	Family history of stomatitis (see Case 23)	,,	A.	10	Yes	Neg. 96 hrs.	Familial	Several new sets made N. and O.B	Improved; but relapsed
13	73	2	Nil relevant	,,	Some ersatz material. V. 1 yr.	4	,,	+ V. 96 hrs.	Sensitivity to V.	Remade A. N.B.	Cleared
14	56	1/12	Recurrent tonsillitis	Yes	V.	25	No	Neg.	Infective	Nil dental	Cleared with tonsillitis. To have tonsillectomy
15	35	6/12	Seborrhoeic sycosis 10 years	No	A.	2	,,	,,	Malocclusion	O.B. 3/16"	Cleared
16	50	2	Cholecystectomy 5 years ago	,,	V.	15	Yes	+ V. 48	Sensitivity and infection	Remade A. O.B. 3/16"	Cleared; but relapses with cold
17	45	3	Nil relevant	,,	V. (14) A. (10)	24	No	Neg.	Malocclusion and seborrhoeic	Remade. O.B. 3/16"	Cleared; but relapsed. Cleared with ung. steroxin
18	36	1	Malaria, 1922	Yes	A.	10	Minor only	,,	Malocclusion	O.B. 1/16"	Cleared
19	38	1/52	Nil relevant	,,	V.	20	,,	Doubtful + V.	Sensitivity	Remade A.	,,
20	60	3/12	,, ,,	,,	A.	15	No	Neg.	Malocclusion	Remade A. O.B. 3/16"	,,
21	62	2/12	Duodenal ulcer, 1943	,,	A.—upper. V.—lower	40	Yes	Neg. 96	,,	Remade A. O.B. 3/16"	Cleared and relapsed
22	68	10	Congenital web in throat. Operation, 1943	,,	V.	40	,,	+ V. 72	Sensitivity	Remade A. N.B.	No change, including mouth lesions
23	47	20	Crohn's disease at 38	No	V. A.	19 3	No	Neg.	Malabsorption	N.B.	Cleared after operation for Crohn's disease
24	61	4/12	Nil relevant	Yes	V.	15	Yes	Delayed + V. 96	Sensitivity	Remade A. O.B. 3/16"	Improved
25	60	6/12	Constitutional eczema 6/12	,,	V.	40	No	Neg.	Part of constitutional eczema	Remade A. N.B.	No change
26	43	2	Hysterectomy 10 years ago	,,	A.	12	Yes	,,	Malocclusion	O.B. 3/16"	Cleared
27	22	8/12	Perlèche in childhood	—					,,	Local only	Cleared and relapsed
28	57	4	Hysterectomy, 1931. Thyroidectomy, 1930. Lupus erythematosus, 1934	Yes	A.	5	Yes	Neg. 96	? Sensitivity	Remade V. N.B.	,, ,,
29	47	4/12	Nil relevant	No	A.	8	No	Neg.	Malocclusion	Remade. O.B.	Improved
30	36	2	Recurrent subluxation temporo-mandibular joint	Yes	V.	17	Yes	+ V. 96	Sensitivity	Remade A. N.B.	Cleared
31	73	6/12	Nil relevant	Variable	V.	40	No	Neg.	? Sensitivity	Remade A. N.B.	Cleared. Occasional minor relapse
32	46	2	Chronic perionychia 13 years	No	V. A.	23 2	Yes	,,	Malocclusion	O.B. 3/16"	Improved
33	77	1	Lichen planus	,,	V.	20	,,	Delayed + V. 96	Sensitivity	Remade A. N.B.	Cleared (no mucosal change)
34	82	3/12	Seborrhoeic dermatitis 10 years	,,	V.	30	No	Neg.	Part of seb. derm.	Nil dental	Cleared with general condition
35	52	3	Psoriasis 25 years. Arthritis 4 years	,,	V. A.	12 4	Yes (patchy)	,,	Malocclusion	O.B. 3/16"	No change
36	73	2/12	Constitutional eczema 3/12	,,	V.	4	Minor only	,,	Part of constitutional eczema	Nil dental	Cleared with general condition
37	56	4	Nil relevant	Yes	V.	30	No	,,	Malocclusion	Remade. O.B. 3/16"	Cleared and relapsed
38	46	1	,, ,,	,,	A.	2	,,	,,	Infective	Nil dental	Cleared with ung. quinolor co.
39	56	2	,, ,,	,,	V.	38	Yes	+ V. 48	Sensitivity	Remade A.	Cleared
40	31	18/12	Pleurisy with effusion	No	A.	4	Yes (L.P.-like)	Delayed + A. 96	,,	Remade V.	No change. Not a case of angular stomatitis, but included because of positive patch test

A. = Acrylic. B. = Bakelite. V. = Vulcanite. N.B. = Normal Bite. O.B. = Opened Bite.

TABLE I.—*Summary of Results—continued*

Case No.	Age (Years)	Duration of Condition (Years)	Past Medical History	Worn at Night	Material of Dentures	Duration of Wearing (Years)	Mucosal Lesions	Patch Test Results	Ultimate Diagnosis	Treatment	Result
41	43	2	Parapsoriasis en plaque 10 years	Yes	A.	2	Yes	Neg.	Malocclusion	Remade. O.B. 3/16"	Cleared
42	61	7	Thyroidectomy 10 years ago	No	V.	20	No	„	? Sensitivity	Remade A. N.B.	„
43	45	4	Nil relevant	Yes	V. A	11 4	Yes	„	? Sensitivity	Remade V. N.B.	Improved
44	48	2½	„ „	No	V.	15	Slight	Delayed + V. 96	Sensitivity	Remade A. N.B.	„
45	65	3/12	Pernicious anaemia since 49	„	V. A.	32 5	Yes	Neg.	Malocclusion	Remade. O.B. 3/16"	Cleared
46	55	3	Nil relevant	„	V. A.	27 5	„	?+A. (coloured)	? Sensitivity	Remade V.	Cleared. N.B.

A.=Acrylic. B.=Bakelite. V=Vulcanite. N.B.=Normal bite. O.B.=Opened bite.

Secondly, investigation of the presence of monomer in denture material was carried out by submitting to a vacuum for several hours finely shaved particles of material made under varying conditions. Any loss of weight was taken to indicate loss of free monomer in the material.

Investigation of Denture Material

Sample I: Material processed at 100° C. for two hours, and brought to 100° C. slowly; age, several days. Sample II: Material brought to 100° C. slowly and chilled suddenly without processing. Sample III: Material processed at 100° C. for four hours; age, two days. Sample IV: As for Sample III, but aged five days.

TABLE II.—*Results*

	Sample I	Sample II	Sample III	Sample IV
Initial weight of sample (g.)	0·0862	0·4277	0·2375	0·2592
Loss of weight (g.)	0·0000	0·0200	0·0021	0·0016
Percentage loss	0	5	0·9	0·6

The conclusions drawn from these results after allowance had been made for experimental error and other factors which might influence them were that, while it seems likely that some monomer is present in extreme cases of underprocessed material, it is impossible to say whether there is any in normally processed and aged material; but if any is present at all it is probably only a fraction of 1%.

Malocclusion

Apparently, because it prevents discomfort when dentures are fitted, it is standard dental practice to close a patient's normal bite. This causes sagging of the mouth with accentuation of the angular creases. These tend to retain saliva and form an excellent nidus for organisms, increasing the likelihood of angular stomatitis. There is no doubt that this is a contributory factor in some cases; but many edentulous people never develop the condition.

In these series, results of opening the bite to remove the mechanical sagging proved rather conflicting. Some cases rapidly cleared completely, others cleared temporarily and relapsed, and one (Case 35) showed no improvement whatever.

The standard procedure here was to open the bite 3/16 in. (4.8 mm.), but in many instances this proved impracticable, mainly because of resultant discomfort in the nature of temporo-mandibular joint arthritis. To obviate this, it was decided to open the bite gradually 1/16 in. (1.6 mm.) at a time every few months; but as yet there has not been time to assess the value of this technique.

It is to be noted that only one patient in this series (Case 29) did not wear dentures, and in this instance there was some malocclusion and apparently no other contributory cause, although the patient admitted to having had the habit of licking his lips in childhood. There was usually a quick response to any mild antiseptic applied locally, so that there was probably an infective cause.

Results

Table I gives the relevant findings in 46 cases. The nature of the study did not lend itself well to statistical analysis, and it was not thought profitable to pursue this line of investigation.

Of the 46 cases treated, 22 cleared completely, 9 cleared but relapsed, 10 improved, and in 5 there was no change. Of those that were cleared, 18 had new dentures and 4 were given only local treatment.

Summary and Conclusions

A series of 46 cases of angular stomatitis associated with artificial dentures have been investigated.

There are several aetiological factors concerned in the production of angular stomatitis, and a full investigation of each case is necessary.

Patch tests to denture materials may be delayed, and patches should be left *in situ* for at least 96 hours.

The nature of the sensitizing material remains obscure, but may be connected with the colouring material.

Opening of the dental bite will result in the cure of some cases, but cannot be guaranteed to be permanent.

My thanks are due especially to Dr. J. T. Ingram for his helpful criticism and permission to use his cases in this investigation; to Drs. F. F. Helier and S. T. Anning, who also permitted me to use their cases; and to the staff of the dental school, without whose co-operation the practical work could not possibly have been carried out. Mr. McNaughton, of the chemistry department of the University of Leeds, also helped considerably in connexion with the investigation of incomplete polymerization of dental plates.

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According to a report in the *Manchester Guardian*, it was made known at the Annual Conference of the National Institute of Houseworkers on May 18 that the Institute is now operating a programme for training hospital domestic workers. This scheme is being carried out in conjunction with the Leeds General Infirmary and the London Hospital. Domestic workers already employed in the hospital will receive a short part-time training, while a longer period of training is available for new employees between the ages of 15 and 18. A diploma will be awarded. The programme of training is being financed by grants from the Nuffield Provincial Hospitals Trust and the London Hospital free endowment funds.

KATAYAMA DISEASE, EARLY TOXAEMIC STAGE OF BILHARZIASIS

WITH A REPORT ON A CASE SHOWING PULMONARY INFILTRATION

BY

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AND

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It may be many months after the bilharzial parasite has entered the body that the disease becomes recognized. However, in a small number of cases symptoms and signs develop after the first month, and these manifestations are referred to as the Katayama syndrome or the early stage of toxaemia. Though reported as occurring more commonly in patients infested with *Schistosoma japonicum*, this syndrome is seen in *S. mansoni* but only occasionally in *S. haematobium* infection.

We have had occasion to treat a child soon after initial exposure to bilharzial infestation. He displayed the classical signs of the Katayama syndrome. We record this case as the literature on the subject is extremely sparse, particularly concerning the pulmonary changes. The pathogenesis and clinical features of this interesting condition are also reviewed.

Case Report

A boy aged 7½ years paddled on a single occasion (December 8, 1952) in a river known to be infested with bilharzial snails. He could not recall any itching of the skin at that time and remained in good health until January 3, 1953. On that day he felt tired and had no appetite; his temperature was 100° F. (37.8° C.). During the following five days his temperature ranged from 100 to 104° F. (37.8 to 40° C.), but, apart from recurrent vomiting attacks, he did not complain of any specific symptoms.

Physical examination was entirely negative. A blood slide showed no malaria parasites, but revealed a marked increase of eosinophils. He was thereupon admitted to hospital for further investigation. Soon after admission he developed a persistent dry cough and became slightly cyanosed and breathless. Examination showed coarse rales scattered over both lungs, but no other physical signs. Without any specific treatment his temperature fell by lysis to normal ten days after the onset of illness. The cough and vomiting rapidly improved, and apart from loss of weight and a pallid complexion he appeared perfectly normal.

Laboratory Investigations.—On January 9 the white blood cells numbered 36,100 (neutrophils 42%, lymphocytes 11%, monocytes 3%, eosinophils 44%), and on January 12 27,400 (neutrophils 42%, lymphocytes 8%, monocytes 1%, eosinophils 49%). Repeated urine tests revealed no abnormalities. No pathogenic cysts, ova, or parasites were seen in numerous tests of the faeces. *X*-ray examination of the chest on January 10 showed a diffuse miliary type of lesion confined mainly to the middle and lower zones of both lungs, especially the left, where the lesions appeared to be almost confluent. A cercarial skin test was negative.

A diagnosis of probable Katayama disease was made and the patient was discharged and kept under observation.

He was examined again on February 8. He complained of feeling tired, his appetite was poor, and his mother expressed concern at his listlessness and pallor. His cough had disappeared. A further chest *x*-ray film showed complete clearing of the focal pulmonary consolidation. On February 10 the white blood cells numbered 16,900 (neutrophils 38%, lymphocytes 23%, monocytes 2%, eosinophils 37%). Examination of the urine and faeces was again negative.

On February 24 he again became pyrexial and complained of severe abdominal pain and diarrhoea. The spleen was now palpable and he was very tender over the liver area. On the following day diarrhoea persisted and the lateral spined ova of *S. mansoni* were found in the faeces. Treatment with "anthiomaline" was started, and within two weeks he showed a marked improvement. A follow-up examination four months later showed complete restoration of health.

Discussion

The clinical picture of the toxaemic stage in Southern Rhodesia is very variable. It may be mild or severe (Gelfand, 1942; Gelfand and Osburn, 1943). In many it may simply be labelled "urticaria due to food allergy"; in others the picture may cause undue alarm and the diagnosis of acute miliary tuberculosis may even be considered. The essential features comprising this syndrome are:

Age.—In our experience the toxaemic stage is seen in the child and not in the adult, and only a small proportion of infected children are so affected.

Pyrexia.—This may be prolonged over many days, but more often is characterized by periodic rises with long apyrexial intervals. In most cases, despite a high temperature, the child does not seem to be seriously disturbed.

Symptomatology.—General malaise, loss of appetite, and frequent vomiting are usually the only symptoms. With lung involvement a cough is characteristic, and in the later stages tenderness over the liver area is a frequent finding.

Loss of Weight.—This is often a noticeable feature, and appears to be mainly related to the frequent vomiting and poor appetite.

Urticarial Eruptions.—These often appear in crops and at times assume the features of angioneurotic oedema affecting the orbits, face, penis, and scrotum.

Splenomegaly.—Splenic enlargement is usually noted towards the end of the toxaemic stage, and subsides even though no antibilharzial treatment is given.

A High Blood Eosinophilia.—This is constantly present in all cases, and is the one feature which is maintained throughout the course of the disease. The actual count is usually between 20 and 60%. It is probable that the eosinophil count remains elevated until active treatment is started.

Lung Involvement with Radiological Changes.—It is probable, because of failure to examine the lungs radiologically and owing to the transitory nature of the radiological features, that these are rarely demonstrated. In the above case extensive miliary changes were shown, and it is probable that these reveal the severest degree of pulmonary involvement.

Pathogenesis

In view of the non-fatal nature of the early toxaemic stage of bilharziasis, there are no pathological data available. However, the general symptomatology and major signs such as urticaria, eosinophilia, and transient pulmonary infiltration suggest an allergic reaction to the developing schistosome.

In the case reported the toxaemic stage appeared 35 days after exposure. It is known that mature female schistosomes with fully developed ova in their uterine canals are found in the portal vein four to six weeks after the cercariae have pierced the skin or mucous membrane. It is therefore probable that 35 days after exposure the fully matured female has found her way via the mesenteric vessels to the small venules of the large intestine, and that ova deposition has begun. It is therefore suggested that the early bilharzial toxaemia is an intense allergic reaction towards this stage of the life cycle of the schistosome. This reaction occurs usually in children, and often, as in the present case, in a child known to suffer from other allergic conditions.

This concept of the nature of Katayama disease has received much confirmation in recent years by work done on closely

related subjects. Crofton *et al.* (1952) reviewed the entire subject of pulmonary eosinophilia. The latter they define as a condition in which pulmonary infiltration on the radiograph is accompanied by blood eosinophilia, but in which any of four conditions (the resolving stage of pneumonia, hydatid disease of the lung, Hodgkin's disease, and sarcoidosis) can be excluded. According to their classification of pulmonary eosinophilia, the Katayama syndrome would be grouped under that of simple pulmonary eosinophilia (Loeffler's syndrome).

The pathology in simple pulmonary eosinophilia has not been studied, as the condition is not fatal. However, Von Meyenburg (quoted by Crofton *et al.*) described changes which he considered to be those of Loeffler's syndrome in three soldiers who died from trauma. Irregular bronchopneumonic foci were noted which were seen microscopically to consist of small areas of alveolar exudate with many eosinophils. In one there was an eosinophilic infiltration of the interstitial tissue. In two cases ascarides were found in the intestine. Crofton *et al.* conclude that the entire group of pulmonary eosinophilias represent a hypersensitivity reaction of the body to various stimuli. When the hypersensitive reaction is brief and involves only the alveoli the manifestation is a simple pulmonary eosinophilia.

The breakdown of normal, abnormal, or foreign protein in the body tissues results in the release of histamine. Vaughn (1953), by injecting extracts of ascaris and of histamine into guinea-pigs, was able to demonstrate a great concentration of eosinophils in the pulmonary tissue. Twelve hours after the injection widespread thickened areas with a patchy consolidation were a common finding, and microscopical study showed a gross eosinophilic infiltration of the perivascular and peribronchial connective tissue. The changes, though similar, were more extensive after ascaris extract than after histamine injection. In Vaughn's opinion the biological purpose of this eosinophilic infiltration lies in the fact that the eosinophil, being in effect a carrier of histamine, is performing its function in delivering a substance to the lung, where it is inactivated by histaminase or another related enzyme.

In 1949 Sprent (quoted by Crofton *et al.*, 1952) sensitized mice to various ascaris extracts by parenteral injection and also produced striking pulmonary changes, including an eosinophilic infiltration. In a case of ascariasis it is known that the life cycle includes a stage of pulmonary migration, but as the result of Sprent's and Vaughn's experiments it is probable that the transitory pulmonary shadows seen in that condition are also better explained as an allergic phenomenon than as a reaction to the migrating larvae.

Further evidence of the allergic nature of this group of diseases is recorded by Wright and Gold (1945), who describe nine cases of pulmonary eosinophilia associated with creeping eruption, a local condition of the skin caused by the filariform larvae of *Ancylostoma braziliense*. Furthermore, in view of the similarity of the lung changes associated with eosinophilia which occurs in other parasitic diseases such as ascariasis, trichiniasis, cutaneous helminthiasis, amoebiasis, and liver-fluke infestation, the pulmonary changes seen in Katayama disease can best be accounted for on an allergic basis.

At this stage attention should be brought to the recent interest shown in the eosinophilia hepatomegaly syndrome of young infants and children caused by infestation with the larvae of *Toxocara canis*, a dog roundworm.

Beaver *et al.* (1952) and Milburn and Ernst (1953) have demonstrated the larvae in the liver of affected patients. The latter authors suggest that other diseases, such as Loeffler's syndrome and tropical eosinophilia, may also be due to visceral nematode larvae migrations. In this connexion Muhleisen (1953) demonstrated filariform hookworm larvae in a patient who developed asthmatic symptoms one week after the onset of creeping eruption. Such symptoms had previously been regarded as being of allergic origin.

To our knowledge, no sputum studies have been done on patients in the toxaemic stage of bilharziasis, but it is thought most unlikely that the transient pulmonary infiltrations and other symptoms of the Katayama syndrome could be accounted for by cercariae trapped in the capillary bed of the lung or by migrating schistosomes. There is no evidence that the mature schistosome migrates anywhere but to the vesical and intestinal venous plexuses. All extra-urinary and intestinal forms of bilharzia are due to embolization of ova from the above sources.

If the syndrome was due to cercariae trapped in the lung capillaries, symptoms would be expected soon after infestation, and would not appear three to four weeks later.

Summary

A case of Katayama disease caused by *Schistosoma mansoni* is reported. Symptoms developed 26 days after a single exposure to infected water.

In addition to the well-known symptoms and signs of this condition, a marked transient pulmonary infiltration is demonstrated.

The pathogenesis of pulmonary eosinophilia in schistosomiasis is briefly discussed, and it is thought that the symptoms are best explained on an allergic basis.

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Medical Memoranda

Use of the Hodge Pessary in the Sling Operation

The use of a Hodge pessary in assisting diagnosis and as a test of the desirability, or otherwise, of carrying out a sling operation in cases of retroversion with symptoms is too well known to warrant further consideration here.

Its employment, however, as an instrument in the technique of the Baldy–Webster sling operation has never come to my notice, and I have not been able to find any such reference in the literature, nor have the many colleagues whom I have questioned. During the past 18 months I have used the pessary in 12 cases in which the Baldy–Webster sling operation has been carried out.

On the evening before operation the vagina is cleansed in the usual way and a Hodge pessary of suitable size inserted, or insertion may be left until the following day, when, with the patient anaesthetized and ready for operation, the pessary is introduced with adequate antiseptic precautions. At operation it is found that the uterus is maintained in good position, and the actual sling procedure is facilitated and simplified. In some of the cases the pessary has been removed 24 hours post-operatively, whilst in others it has been kept *in situ* for five days. In no instance has there been any indication of infection or other untoward effects, and the immediate results have been excellent. So far as can be judged at present by follow-up examination at the gynaecology post-operative clinic, the relatively long-term results leave nothing to be desired.

COMMENT

The use of a vulsellum forceps or a catgut traction suture in the fundus of the uterus to hold this organ forward in a reasonable position whilst operating is largely condemned, as damage may be done to the myometrium, and the punctures and knots may form points to which adhesions may attach, with possible unhappy results, especially for a woman of child-bearing age. An assistant's hand may support the uterus, but frequently this is found to be a doubtful

benefit, as it is often cumbersome, it obscures the field of operation, and it interferes with manipulation. With the use of a Hodge pessary to support the uterus in a normal position from below, through the vagina, damage is not done to the uterine fundus, the field of operation is left clear, and an assistant is hardly necessary.

Further, if a pessary of correct size has been used for diagnostic purposes and has relieved the symptoms, it is reasonable to assume that it has maintained the uterus in the optimum position, and that a similar pessary should be in position during the operation. Without its use the uterus may be supported too loosely, in which case the operation may fail in its purpose, or the uterus may be supported too tightly, with the possible substitution of symptoms such as dragging or pain in the iliac fossae and groins. Either of these contingencies is not unknown. Viewed in this light, the Hodge pessary should serve a useful purpose in other operations for correction of retroversion, such as the Gilliam procedure.

I thank Dr. Hugh Stirling, obstetrician and gynaecologist, Eastern District Hospital, Glasgow, for his interest and for permission to publish.

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Treatment of Actinomycosis with Aureomycin

Reported cases of actinomycosis treated with aureomycin are few. As clinical trial is the only effective guide to dosage with this therapy a case is reported and the literature is reviewed.

CASE REPORT

A farmer aged 31 was admitted to hospital complaining of a lump in the neck which had been present five weeks.

Examination disclosed a lump 2.5 cm. in diameter in the skin of the right side of the neck. It was spherical, smooth, ill-defined, firm, and fluctuant. The skin over it was indurated and reddened but not warm, and no sinuses were present. There were no other abnormal physical signs. Blood counts and *x*-ray films of the jaw, spine, and chest were all normal. The Wassermann reaction was negative. Aspiration of the lump produced pus which showed *Actinomyces israeli* on anaerobic culture.

Aureomycin was given: 3 g. daily for two days, 2 g. daily for eight days, and 1 g. daily for 23 days. It was administered six-hourly, to a total of 45 g., together with vitamin-B complex. The lump subsided rapidly and was no longer visible within one week of the beginning of treatment, although on palpation the skin was fibrosed, and this persisted.

Within a month of cessation of treatment, however, the lump had recurred and the presence of *A. israeli* was again confirmed bacteriologically. Aureomycin was recommenced, 3 g. daily being given for 28 days, in divided doses, together with vitamin-B complex. Once again there was the same rapid subsidence of signs, only a nodule of fibrous tissue remaining. Four months later there had been no recurrence. The only toxic reaction noted throughout both courses was occasional vomiting.

DISCUSSION

In vitro tests of sensitivity of actinomyces to aureomycin have been carried out by Hager *et al.* (1949), Strauss *et al.* (1951), and Garrod (1952), but conditions necessary for the growth of actinomyces are highly unfavourable to the action of aureomycin.

Cases of actinomycosis treated with aureomycin are reviewed in the accompanying Table, but two need further comment. The case treated by Grant (1951) was associated with a fractured mandible. Treatment was interrupted by the patient taking his own discharge and the condition recurred, but was cured by a second course of aureomycin. A case of actinomycosis of the chest wall with clinical pericarditis was reported by Zoeckler (1951). Only 26 g. of aureomycin was given over the course of 13 days, but there was no recurrence three months later.

In all the cases reported *A. israeli* was isolated by culture. All were regarded as cured, and in most cases other methods of treatment had already been tried without notable success. Rapid improvement followed administration of aureomycin in all cases, and indurated tissues with draining sinuses healed, leaving only minimal scarring. Surgical drainage was thought to be unnecessary in all cases except one of a hepatic actinomycotic lesion. Comparable results have not been reported with any other form of therapy.

Although Zoeckler's case was cured with only 26 g. of aureomycin, the table shows that a course of aureomycin 3 g. daily for ten days, followed by 2 g. daily for a further 18 days in divided doses, as used by McVay *et al.* (1950, 1951), to be indicated for most cases, although some—for example, abdominal actinomycosis—will need a heavier dose.

Cases of Actinomycosis treated with Aureomycin

Authority	Site	Length of History	Period of Treatment in Days	Total Dose in G. *
Glahn (1952)	Cervico-facial	(?) 6 months	21	42
Grant (1951)	,,	3 months	26 (21 days' interval)	52
			40	Not stated
Kelly (1951)	Intestinal	14 ,,	107	116·5
McVay *et al.* (1950, 1951)	Cervico-facial	5 ,,	28	99 + local irrigation
	,,	6 ,,	28	66 + local irrigation
	,,	3 ,,	28	66
	Hepatic	2 years	58	21 intravenously; 158 by mouth; + local irrigation
Ten Berg (1950)	Ileo-caecal	22 months	Not stated	Not stated
Thompson and Wax (1950)	Tibia	3 ,,	29	42
Wright and Lowen (1950)	Cervico-facial	22 years	Not stated	Not stated
Zoeckler (1951)	Chest wall	3 months	13	26

* Administered by mouth unless otherwise stated.

Aureomycin must be regarded as the treatment of choice in actinomycosis, but adequate treatment is necessary if relapse is to be avoided.

I should like to thank Mr. C. J. Cellan Jones, under whose care this patient was admitted, for permission to publish this case.

Swansea Hospital. S. A. SELIGMAN, M.B., B.S.

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Reviews

A COMPLETE GUIDE TO INFLUENZA

Influenza and Other Virus Infections of the Respiratory Tract. By C. H. Stuart-Harris, M.D., F.R.C.P. Foreword by C. H. Andrewes, M.D., F.R.C.P., F.R.S. (Pp. 235; 98 figures. 30s.) London: Edward Arnold. 1953.

Although the virus of influenza was discovered only 21 years ago, it has now been more extensively studied than any other. It has been adapted to ferrets, mice, and to growth in eggs, classified into several varieties, purified, analysed, "re-combined," and made into several kinds of vaccine; and the phenomenon of erythrocyte agglutination by it has been examined from every conceivable point of view. One practical result of this study has been to make it possible to diagnose an attack of influenza by any of several different laboratory methods: this in its turn has been the basis of a world-wide survey of epidemiology, the headquarters of which are in this country. Very little information about all this work has yet found its way into textbooks, but after the appearance of this monograph their authors will have no further excuse for dealing with the subject inadequately. The latter part includes chapters on psittacosis, primary atypical pneumonia, Q fever, the common cold, and "febrile catarrh" and pharyngitis of unknown aetiology; concluding chapters discuss prevention by hygienic measures and immunization, and treatment—whether by chemotherapy or mere rest in bed, a steam kettle, and some aspirin and codeine.

The author is that unusual combination in this country—though a more familiar figure in the U.S.A.—the clinician-cum-laboratory worker. He can describe not only the pathology of these diseases and the laboratory methods used in connexion with them but their clinical features, of which indeed he has made a special study throughout a career largely devoted to this subject. He therefore writes with unusual authority, and another book dealing in this way on the one hand with aetiology, laboratory diagnosis, and epidemiology, and on the other with symptomatology, clinical diagnosis, and treatment, would be hard to find. The analyses of symptoms and signs in different varieties of acute respiratory disease and the well-illustrated discussions of radiological diagnosis are a valuable feature. There are also many well-produced illustrations of the histology of influenza lesions in the ferret and man: the latter show the consequences of secondary staphylococcal infection, and the implication in the text that a pure influenza virus infection is non-destructive of the mucosa and indeed is not known to produce any characteristic lesion may occasion some surprise. The distinction drawn between terramycin and aureomycin as anti-staphylococcal drugs is contrary to the general experience that cross-resistance between them is almost invariable.

Different parts of this work will appeal to a variety of readers. To the investigator it performs a valuable service in throwing into relief two apparently distinct and fairly well characterized diseases of which the causes are still unknown. Of these the acute angina which is not streptococcal seems particularly to deserve rescue from its comparative neglect.

L. P. GARROD.

CLINICAL SURGERY

Progress in Clinical Surgery. By various authors. Edited by Rodney Smith, M.S., F.R.C.S. (Pp. 414; 112 illustrations. 36s.) London: J. and A. Churchill. 1954.

The science and art of surgery continue to advance, and no one nowadays will be rash enough to say that the end of achievement is in sight. It is impossible for textbooks to keep quite up to date, and there is need for such a book as this which is "intended to supplement, and not to replace, the standard surgical textbooks." The volume is designed to give help "particularly to the postgraduate student working for his final F.R.C.S. examination and the younger surgeon with a recent hospital appointment." We have no doubt that it will adequately fulfil those functions, though in some chapters the young surgeon might look for greater detail in technique. The various sections are written by experts of acknowledged authority, and throughout the book the editor has maintained unity and balance.

The volume opens with a startling sentence: "It is possible that nearly as many patients are killed by fluid replacement as are cured by it." Can it be so? As one looks back one remembers patients who did not improve as they should have done by fluid replacement, and it may have been due to the fact that the past generation did not know so much about electrolytes and the equivalents of sodium and potassium. Anyway, the young surgeon now has the opportunity to learn all about them.

Throughout the volume the recent advances in surgery are well set forth and a judicious clinical attitude maintained. During the past five years the most spectacular advances have been in the surgery of the heart and great blood vessels, and there are excellent chapters summarizing the new work. Yet even while this book must have been in preparation further remarkable advances took place, for it is within the past two years that large aneurysms involving the descending aorta or its main branches have been extirpated and the excised length of aorta replaced by a graft.

One of the most valuable chapters, and the best illustrated, is that dealing with the injured hand. Let the young surgeon learn and apply the principles laid down in this chapter and the earning capacity of thousands of injured workmen will in future be greatly increased. A useful book.

ZACHARY COPE.

NUTRITION IN INDIA

Nutrition in India. By Dr. V. N. Patwardhan. (Overseas Ed. Pp. vi and 345; 27 illustrations. Rupees 15.8.) Bombay: The Indian Journal of Medical Sciences. 1953.

Dr. Patwardhan, who is director of the well-known Nutrition Research Laboratories at Coonoor, appears to have had two reasons for writing this interesting book. Doubtless his first concern was to draw further attention to the defective diets on which many Indians have to subsist, and to describe the forms of ill-health caused by this malnutrition. His second desire has been to review the research on nutrition that has taken place in India during the last forty years, both on points of local interest and on more fundamental problems. He observes that research workers in other countries must often have difficulty in obtaining access to Indian publications on nutrition. The present volume will help to make good this deficiency.

The topics covered include Indian foodstuffs, rice, wheat, and other cereals, pulses and legumes, milk and milk products, proteins, fats, minerals, vitamins, basal metabolism, nutrition surveys, deficiency diseases, and nutrition in relation to public health. British readers will perhaps be most interested, however, by accounts of the widespread poisoning which can be caused by certain common Indian foods. Thus when poverty necessitates the consumption of certain easily grown pulses the condition known as lathyrism often develops and leaves the victim permanently crippled by paralysis of the legs. Another form of poisoning, epidemic dropsy, is caused by the contamination of mustard seeds by the weed *Argemone mexicana*. The author acknowledges the debt of India to McCarrison for the initiation of nutritional research early in the present century. For its literary clarity and for the excellent arrangement of its subject matter this book may be warmly recommended to all who are interested either in nutrition or in India.

T. MOORE.

MEDICAL ELECTRONICS

Medical Electronics. By G. E. Donovan, M.D., M.Sc., D.P.H. (Pp. 215; 36 figures. 30s.) London: Butterworth and Co. 1953.

In his preface the author says that the literature on the applications of electronics in medicine is no longer a stream but a river in full flood. It is a river in which one feels that most doctors would be likely to drown. The reviewer is a radiotherapist and therefore probably has a more ready acquaintance with the subject matter of the book than most doctors, and yet, after reading it, his first symptoms were those of mental congestion.

The technique of electronics and the technicalities are all so new that only a nodding acquaintance with the numerous applications of the subject resulted from reading about it in this book. The difficulty is in the vastness of the subject, lack of insight of the reader into the procedures used, and the fact that the language is different from what one usually reads. For instance, few doctors, of whom the reviewer is not one, could understand the following: "The apparatus uses a scanning technique known as the intercept length method and consists essentially of a Muirhead facsimile transmitter and a pulse width analyser counter circuit incorporating dekatron scaling tubes." Such statements abound.

There is no doubt that the author is a master of his subject, and there is equally no doubt that the subject offers to the medical profession new methods of investigation and recording of the very existence of which most of us are ignorant. If he is writing for a medical public the author should leave out most of the technicalities, simple and essential as they might be to him, and concentrate on a few more examples showing the value of the methods in medicine. If the technicalities are to stay they should be explained and defined better—for instance, by an early simple chapter on the physics of the subject associated with a glossary of terms to be used. As an indication of the wonderful possibilities open to us in accurate quantitative work carried out with minimal trouble to the doctor the book should be read by all medical students and by all those working in hospitals. The obvious way to make use of the facilities offered seems to be to appoint to each hospital someone like the author in a place easily accessible to all members of the staff so that each may ask the electronics expert to produce the particular apparatus he is interested in.

FRANK ELLIS.

ADMINISTRATIVE MEDICINE

Administrative Medicine: Transactions of the First Conference March 9, 10 and 11, 1953, New York. Edited by George S. Stevenson, M.D. Foreword by Willard C. Rappleye, President, Josiah Macy Jr. Foundation. (Pp. 176. $3.) New York: Josiah Macy Jr. Foundation. 1953.

This is a verbatim report of an interesting discussion by some 20 experts representative of every aspect of medicine and sociology of how best to integrate all concerned in an ideal system of medical care. No resolutions were submitted, discussion was quite free, and many differences of opinion emerged; but team-work was declared to be essential in any system aiming to be complete. The team must include not only the obvious medical elements but representatives of every branch of social service, with those of labour. The question of a State medical service was carefully avoided, but strong support was given to the numerous voluntary medical aid schemes now in operation, though all were deemed incomplete. The medical curriculum came in for severe criticism as ignoring the social sciences and as a consequence turning out doctors ignorant of these vital elements in civilization, and, therefore, essential to any form of medical practice. Such emphasis was laid on this criticism that one participant in the conference asked if it was intended that the social as well as the natural sciences should be a prerequisite to the study of medicine. He was not alone in thinking that if this was the case the future doctor might be a more learned man but possibly a less useful one to the average patient.

The book left on me certain definite impressions. (1) Of the great difficulty of establishing a national medical service in a country constituted as is the U.S.A.; (2) of the obvious sincerity of the conference in advocating group practice; (3) of the risk, if the idealists had their way, of the medical profession being organized to death; and (4) that no conference of this kind is complete without the presence of some ordinary potential patients who might be able to keep the feet of the idealists on the ground.

ALFRED COX.

PHYSICAL MEDICINE AND REHABILITATION

Physical Medicine and Rehabilitation. Edited by Basil Kiernander, M.B., B.S., M.R.C.P., D.M.R.E., D.Phys.Med. Introduction by the Rt. Hon. Lord Horder, G.C.V.O., M.D., F.R.C.P. (Pp. 610+xiv; illustrated. 63s.) Oxford: Blackwell Scientific Publications. 1953.

There have been many developments both in physical medicine and in rehabilitation in the past decade. Good textbooks are badly needed, but few are available and none are entirely satisfactory. The main reason for the shortage is that both subjects, to a greater or less extent, find their application in all branches of clinical practice, and few authors are willing to tackle such a wide field. Dr. Kiernander has tried to produce a combined textbook with the help of 25 contributors on both sides of the Atlantic, and credit must go to him for attempting a difficult task which so many have shunned. As Lord Horder points out in the introduction, the justification for combining the two subjects in a single book is that so much of physical medicine deals with the restoration of function after illness, while rehabilitation, of concern to all branches of medicine and surgery, depends, perhaps above all else, upon efficient physical medicine.

There is much to commend in this book. Many excellent chapters are contributed by leading experts and should be studied by everyone interested in the theme. But some chapters are so indifferent that they spoil the rest of the volume and should be omitted from future editions or given to authors better fitted for these tasks. Some authors, who have previously written books on their subjects, have tried to compress so much into a single chapter that they have sacrificed important detail in an attempt to be comprehensive. Others have included, apparently as padding, unnecessary details of treatment programmes in use in their hospitals. There are too many spelling and printing errors in the text and the indexing is quite inadequate; but, in spite of the many criticisms that can be made, this book has achieved much of its objective. As it stands it can be recommended for the excellent material it contains, much of which is not readily available elsewhere; but substantial rewriting and a great deal of editing must be undertaken before a second edition appears.

F. S. COOKSEY.
D. A. BREWERTON.

STEREOSCOPIC RADIOSCOPY

Die Objektive Stereoskopie an Röntgenbildern: Eine Diagnostische Methode. By Professor Dr. A. Hasselwander. (Pp. 187; 125 illustrations. D.M.27.) Stuttgart: Georg Thieme (Verlag). 1954.

This is a monograph on stereoscopic radioscopy in which the advantages, uses, and difficulties of the method are very fully discussed. New apparatus invented by the author is described by means of which exact measurements may be taken in the third dimension, and even solid models produced from a study of stereoscopic radiographs. The author has devoted his life to the study of three-dimensional anatomy, especially from the point of view of the radiologist, who may find many ideas of use in this special field. Of great practical value to every anatomist is a series of drawings on a reduced scale of the famous coloured lithographs by Wilhelm Braune of frozen sections of the human body. The originals are not always accessible, and these perfect reproductions should be very welcome.

HENRY SOUTTAR.

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DRUG TREATMENT OF HYPERTENSION

The bewildering number of drugs which are said to lower blood pressure has not only made the selection of the best form of medical treatment for hypertension a matter of some difficulty but has underlined the necessity for a knowledge of the natural history of the disease and of its clinical types. Women appear to tolerate high levels of blood pressure better than men, except when hypertension is in the malignant phase[1]; and in elderly persons surprisingly high pressures are often compatible with good health for many years.[2] This is specially noticeable when the blood pressure has risen slowly over many years. By contrast, a rapid increase in blood pressure in young persons is a grave sign and often associated with arteriolar necrosis, which ushers in malignant hypertension. The diastolic blood pressure is a far more important guide to severity than the systolic.

For purposes of treatment patients with essential hypertension—a term used to describe high blood pressure not attributable to any other disease—may be considered in three groups based on McMichael's[1] classification of the condition: first, those with labile hypertension whose diastolic pressure is below 120 mm. Hg and who show no signs of complications; secondly, those with sustained hypertension, with a diastolic pressure around or over 120 mm. and with developing or established complications (encephalopathic attacks, cardiac enlargement, and retinitis) but normal renal function; and, thirdly, patients with hypertension in the pre-malignant or malignant phases, with diastolic pressure rising to 130 mm. Hg or even higher. In the first group the prognosis is good, and the only treatment needed is reassurance and mild sedation. These patients are often obese, and they should be encouraged to lose weight: they often complain of headaches, which are more likely to be due to anxiety—sometimes caused by an injudicious remark about high blood pressure in the consulting-room[3]—than to hypertension.[4] The patient rather than his blood pressure should be treated, and there is no place for powerful hypotensive drugs, which themselves carry a risk. Treatment of patients in the second group is a different matter, for they may suffer from vascular damage and other hypertensive complications, and effective reduction of blood pressure is obviously desirable; while in the third group control of hypertension is a matter of vital importance and great urgency.

For patients in the pre-malignant or malignant stages of the disease the methonium drugs offer the best prospect of relief: they cause vasodilatation and hypotension by blocking transmission of nerve impulses in autonomic ganglia, and several recent reports have shown that they are a useful addition to therapy.[5 6 7] A single subcutaneous injection of an adequate dose will reduce the blood pressure towards normal for two to three hours—an effect which the upright position helps to increase. It is possible to obtain a longer action by using a similar compound (M & B 2050 A or "ansolysen") dissolved in 25% polyvinyl pyrolidine to which 0.1% ephedrine has been added.[8] In a recent issue of this *Journal* Professor F. H. Smirk[9] has described his results in a series of 250 cases treated with methonium compounds for periods up to 3½ years. In his experience this form of treatment has improved the prognosis in severe hypertension, and this is borne out by the fact that, out of 28 of his patients with malignant hypertension, 21 are still living—an average survival time of 22.8 months. Professor Smirk has also noted that an attack of hypertensive left ventricular failure can be terminated by fractional intravenous injection of hexamethonium. Among the notable results of reduction in blood pressure are the disappearance of papilloedema—a finding also noted by Morrison[7]—a decrease in the size of the heart, improvement in the electrocardiogram, and an easing of headaches.

Treatment with the methonium compounds is far from easy: oral administration is unsatisfactory, and may be dangerous, since absorption is irregular and control difficult.[1 10] The drug has to be given by subcutaneous injection two or three times daily, and

[1] *British Medical Journal*, 1952, **1**, 933.
[2] Burgess, A. M., *New Engl. J. Med.*, 1948, **239**, 75.
[3] Platt, R., ibid., 1950, **1**, 951.
[4] Stewart, I. McD. G., *Lancet*, 1953, **1**, 1261.
[5] Turner, R., ibid., 1950, **2**, 353.
[6] Restall, P. A., and Smirk, F. H., *N.Z. med. J.*, 1950, **49**, 206.
[7] Morrison, B., *British Medical Journal*, 1953, **1**, 1291.
[8] Smirk, F. H., *Lancet*, 1953, **1**, 457.
[9] *British Medical Journal*, 1954, **1**, 717.
[10] Kilpatrick, J. A., and Smirk, F. H., *Lancet*, 1952, **1**, 8.
[11] Doniach, I., Morrison, B., and Steiner, R. E., *Brit. Heart J.*, 1954, **16**, 101.
[12] *Lancet*, 1951, **2**, 1002.
[13] Gibbs, D. F., *Brit. Heart J.*, 1952, **14**, 77.
[14] Shapiro, A. P., and Grollman, A., *Circulation (N.Y.)*, 1953, **8**, 188.
[15] Freis, E. D., Rose, J. C., Higgins, T. F., Finnerty, F. A., Kelley, R. T., and Partenope, E. A., ibid., 1953, **8**, 199.
[16] Grob, D., and Langford, H. G., ibid., 1953, **8**, 205.
[17] *Arch. intern. Med.*, 1952, **89**, 523.
[18] Perry, H. M., and Schroeder, H. A., *J. Amer. med. Ass.*, 1954, **154**, 670.
[19] Wilkins, R. W., and Judson, W. E., *New Engl. J. Med.*, 1953, **248**, 48.
[20] Wilkins, R. W., *et al.*, ibid., 1954, **250**, 477.
[21] Wilkins, R. W., *Mod. Conc. cardiovas. Dis.*, 1953, **22**, 198.
[22] Corcoran, A. C., Taylor, R. D., and Page, I. H., *Circulation (N.Y.)*, 1951, **3**, 1.
[23] *Amer. J. Med.*, 1948, **4**, 545.

careful observation is essential in the first weeks of treatment, since tolerance quickly develops.[7 9] Side effects—such as giddiness and faintness on standing due to postural hypotension, dry mouth, difficulty of micturition, constipation, and visual disturbances caused by vagal inhibition—are unfortunately common, although they can be mitigated by careful control of the dosage and by lying down for half an hour after the injection. Patients should always be admitted to hospital for initial treatment with hexamethonium bromide, and they have to be watched carefully after discharge, although they can, like diabetics, be taught to give their own injections. When renal function is impaired the excretion of hexamethonium bromide is retarded, and therefore injections are required less often. McMichael[1] has noted no tendency for moderately increased blood urea to rise during therapy. Dyspnoea, associated with organized fibrinous pulmonary oedema, has been observed in three patients with severe hypertension who were having hexamethonium therapy.[11] This lung change was attributed to some modified sequel of left ventricular failure and to prolongation of survival by treatment: it is not a contraindication to continued therapy.

In spite of the encouraging results achieved with methonium compounds there is clearly a need for a safer hypotensive drug which is easier to use and can be given by mouth. Thiocyanates have largely been abandoned owing to their inefficient hypotensive action, the need for controlling the concentration of drug in the blood, and their unpleasant side effects. The alkaloids of veratrum viride, which cause a reflex vasodilatation, have been reported on recently by Kauntze and Trounce,[12] who obtained good results in only 20% of their cases. The frequent occurrence of vomiting, sweating, and other side effects greatly limits the usefulness of these drugs. The dihydrogenated alkaloids of ergot, which have a sympatholytic action, have a slight hypotensive effect, and a mixture of three such alkaloids ("hydergine") can be given by mouth, although the results are not striking.[13] Hydralazine hydrochloride (1-hydrazino-phthalazine) lowers blood pressure by a central action and by inhibiting the action of histaminase, and is widely used in the U.S.A.[14 15 16] According to Schroeder[17] it has a synergistic action with methonium, and the use of the two drugs together has been advocated. Unfortunately, hydralazine causes severe headache, tachycardia, and an increase in cardiac output; moreover, a syndrome resembling disseminated lupus erythematosus has been observed in patients taking the drug.[18] Many clinicians believe that these complications make hydralazine an undesirable drug for the purpose of reducing blood pressure.

Alkaloids extracted from *Rauwolfia serpentina* ("rauwiloid," "serpasil") have mild hypotensive and sedative properties and reduce the pulse rate.[19 20] They can be given by mouth for long periods and apparently have no serious toxic action. Their effectiveness still remains to be assessed, but they may prove useful in the treatment of anxious patients with tachycardia,[21] or of patients with uncomplicated sustained hypertension whose diastolic blood pressure is below 120 mm. Hg. The practice of using two or even three different hypotensive agents together has some vogue, but is generally undesirable, since assessment of the hypotensive, or toxic, effects of one of the drugs becomes difficult, and the patient is likely to be bewildered by the variety of tablets he is receiving. Finally, the use of a low sodium diet, although not strictly a drug treatment, is worth considering in the treatment of hypertension.[22] Restriction of sodium is the basis of the rice diet introduced by Kempner,[23] but to be effective the daily intake of sodium must not exceed 0.5 g. (or 1 g. NaCl). This makes food very unpalatable, and the diet can be strictly maintained only in hospital, although the use of ion exchange resins may permit the patient to take meals with a higher salt content. Too rigid salt restriction, however, may precipitate uraemia in patients with impaired renal function, so that a low salt diet, like most other forms of therapy for hypertension, also has its limitations.

THE AGED SICK AND INFIRM

The care of old people, and the problems which it raises, command an ever-increasing share of public attention. This is not entirely due to the fact that there are more old people in the community nowadays. It is partly the result of the altered social circumstances in which we live, with fewer children able and willing to look after their aged relatives; partly of medical advance, especially antibiotic therapy, which is reducing deaths among the elderly from pneumonia—in other days a quickly fatal disease (this has increased the number of potential victims to cardiovascular degenerations or malignancy, both of which are apt to cause prolonged illnesses necessitating nursing care); and partly of the difficulty of securing admission to hospital for those old men and women who require it, and particularly for those suffering from chronic disease. While it has become increasingly important to make hospital accommodation available for those old people for whom there is no alternative, at the same time it is essential to do everything possible to assist those who are able, with help, to continue to live in their own

homes. As things are, there are many old people, gravely ill, living at home under conditions almost unbelievably bad. Many of them have no hope of full restoration to health, for one of the important lessons emphasized again in a book by Professor T. Ferguson and Dr. A. N. MacPhail,[1] published last month, is that the patient's health may owe far more to his home conditions than to the disease he suffers from or the treatment he receives for it. The plight of these seriously disabled and elderly people, many of them lying in dreary squalor, is the most compelling of all the problems of old age. Recent articles in the lay press have drawn attention to the urgency of their need, a need painfully well known to medical men and often described in this *Journal*. Six years ago, just before the National Health Service came into operation, Ferguson[2] described the condition of 300 old persons, 62 men and 238 women, who were being treated in their own homes in Glasgow by district nurses, often under shockingly bad conditions. The large majority had been ill for more than six months. Of the 300 patients, 27 suffered from heart disease, 40 from cerebral haemorrhage and hemiplegia, 52 from diabetes, 21 from rheumatism, 17 from cancer; and 52 were described as cases of "senility." Fifty-two were incontinent, and 107 were wholly bedridden. Apart from the ministrations of the district nurse, 78 of the 300 old people looked after themselves without any other assistance, though by no means all of this group could care for themselves in any satisfactory way.

Many old people suffering from chronic sickness of this kind can be treated satisfactorily only in hospital, but there is often great difficulty and long delay in securing their admission to hospital, a difficulty which existed even before the new order of 1948 and not likely to be adequately met by the restoration of relieving-officer powers. The report[3] of the British Medical Association's Committee on the Care and Treatment of the Elderly and Infirm directed particular attention to patients not able to fend for themselves. There is need not only for additional beds for these cases and for their sorting and energetic treatment, but for the development of accommodation of the "half-way" type, since lack of home care on discharge from hospital is a common cause of early breakdown, calling for readmission to hospital. The concept of the "day hospital" is being developed at Oxford,[4] and the results of the experiment there will be watched with interest all over the country. During the past five years the National Corporation for the Care of Old People has had encouraging results from a scheme which enables old people who have been patients in certain hospitals to go away to convalescent homes for periods up to eight weeks. Payment is made by the regional hospital boards.

In these days any kind of institutional care is relatively expensive; and sometimes old people are unwilling to go to hospital, however great their need, fearing that to do so will entail the irretrievable disruption of what home is left to them. Sheldon[5] found that the great majority of the old people whom he studied in Wolverhampton were able to lead independent lives, though some of them required a measure of help which they could not always reasonably obtain from members of their own family. Many efforts have been directed to making life easier for old people, the provision of "meals on wheels," laundry services, and chiropody among them. But, apart from medical and nursing care, what most old people who live in their own homes want is help that will enable them to carry through the ordinary routine of independent living. Sometimes this help can be provided by members of the family circle; sometimes the elderly are dependent for it on the good offices of neighbours. For others a home-help service is essential; many aged invalids at present dependent on neighbourly help place on their neighbours a load which it is unreasonable to expect them to bear. That is not to say that there is not a great place for voluntary effort and voluntary service, but the care of an elderly patient should not be allowed to develop into an intolerable burden. The nursing of these old people by district nurses affords a notable example of what can be achieved under unpromising conditions, given an organization—such as the Queen's Institute—imbued with the spirit of service. The amount of call on home-help services will obviously depend on individual circumstances; for some patients help with the weekly washing may suffice, for others help on two or three days a week, or for an hour or two daily. Obviously no home-help scheme can provide a 24-hour service; but old people who require such a service should not be left in their own homes. The clubs for old people which are being so widely developed might be encouraged to function not merely as centres in which old people could gather for social intercourse and recreation, but as centres from which a voluntary service might radiate to the homes of those who are unable to visit the club premises.

As a long-term policy, the approach to the welfare of old people must be along much more positive lines,

[1] *Hospital and Community*. Oxford University Press. (Geoffrey Cumberlege) for the Nuffield Provincial Hospitals Trust, 1954.
[2] *Lancet*, 1948, 1, 417.
[3] *The Care and Treatment of the Elderly and Infirm*, 1947, B.M.A., London.
[4] Cosin, L., *Practitioner*, 1954, 172, 552.
[5] Sheldon, J. M., *The Social Medicine of Old Age*. London. 1948.
[6] See *British Medical Journal*, 1953, 2, 1436.

directed to the promotion of healthy living, the conservation of active interest, and the prevention of invalidism. But in the meantime the wretchedness of many decrepit old men and women is unworthy of a civilized society. When the matter was raised in the House of Commons recently the Minister of Health[6] referred to this as perhaps the most baffling problem in the whole of the National Health Service. He thought the solution lay rather in the home than in the hospital. "Let us by all means ask if the State has failed," he said, "but let us also ask if the family and the neighbours are doing all they can . . . the local authorities, the voluntary bodies, and the Church." Although it is certainly true that few facets of the social service offer greater scope for voluntary effort than the care of old people, it is equally true that there has not always been that clear lead from official sources so essential to overcoming a problem of such magnitude.

ANAESTHESIA FOR CHILDREN

Clinical medicine demands a clear memory, the ability to correlate disjointed stories, and sound judgment. Surgery demands, in addition, good eyesight and manual dexterity. Joining all these qualities should be one on which greater stress should be laid—namely, kindness. Lacking it, no boy or girl should start a medical career with any intention of practising clinical medicine. Without kindness and gentleness the exercise of the highest technical skill will bring little reward either to the doctor or to his patients. The need for these humane qualities is most clearly seen in the preparation of children for surgery and the management of their anaesthesia. Attention has been directed to these aspects of the surgery of childhood in recent years. Eckenhoff reports an investigation into the effect of premedication or its absence on the post-operative mental state of young patients.[1] Over a period of eighteen months questionaries were sent to the parents of all children admitted to the Hospital of the University of Pennsylvania for an otolaryngological operation. Eckenhoff found that 17% of the replies indicated a personality alteration which might be traced to anaesthesia or to the hospital experience. The changes reported were night terrors, temper tantrums, fear phenomena, and bed-wetting. The incidence of personality change was highest in the youngest children—that is, aged 2 or 3 years—but study of children in all age groups showed that if there was crying and struggling during induction then one of these personality changes was more likely to occur. In this series premedication consisted of pentobarbitone and scopolamine and usually morphine in a dosage recommended by Leigh and Belton.[2] Anaesthesia was administered by resident or staff anaesthetists, or medical students or interns under supervision. It should be noted here that the dosage of oral pentobarbitone recommended by Leigh and Belton and other American workers is far lighter than that normally used by British anaesthetists, who find that 0.6 gr. per stone (6 mg. per kg.) is satisfactory.

Commenting on his report Eckenhoff writes: "A previous report has demonstrated a clear-cut relationship between the type of pre-anaesthetic medication and the incidence of crying prior to induction of anaesthesia. It was shown that 35 to 40% of children 5 years of age or less who received only atropine or scopolamine cried. It was further shown that the use of a barbiturate with the belladonna drug, plus careful attention to the time of administration of the drugs, significantly reduced the incidence of crying. In this respect it was reasoned that the crying child might be the one in whom personality changes were most likely to develop. Obviously, skill of administration of anaesthetics remains of prime importance." In a survey of the subject of children in hospital Mac Keith[3] does not describe any personal follow-up of surgical cases from his own department but states that a "considerable number, chiefly among those under 5, show changes in behaviour for a shorter or longer period after [hospital admission]." He believes that "the three main anxieties which centre round an admission to hospital are the separation from home, the anaesthesia, and the operation," and he gives the sound advice that, "when a child does not have a pre-operative sedative, he should be carried to the anaesthetic room by a familiar nurse, or accompanied by a nurse if a porter carries him, and that this nurse should stay with him until he is unconscious. Certainly being trundled in a trolley lying flat, so that one cannot see where one is going, is alarming."

Children are characteristically highly responsive to the power of suggestion, and by its kindly application anaesthetists are constantly rewarded with a peaceful phase of induction of anaesthesia. This approach to a child patient combined with a careful intravenous induction with thiopentone after adequate sedation with morphine and scopolamine must guard the child's mind from any harmful fears, either real or imaginary. Sheila Anderson[4] has described the details of this method of premedication in detail. More recently H. E. Pooler, of Chesterfield Royal Hospital, has made a short colour film which beautifully shows the value of care and consideration by nurses, orderlies, and anaesthetists towards children undergoing tonsillectomy. There are others who consider their child patients are better protected by the use of narcotics given to the child in its own bed. These drugs usually consist of rectal thiopentone or of one of the oral barbiturates. All have their advocates, and it is impossible to dogmatize on the most successful procedure. The details of the actions of these and other powerful drugs are important to understand, but, having learnt them, let the anaesthetist mingle kindness with his pharmacology. Then no more may be heard of personality changes after operation.

[1] *Amer. J. Dis. Child.*, 1953, **86**, 587.
[2] *Anesthesiology*, 1946, **7**, 611.
[3] *Lancet*, 1953, **2**, 843.
[4] Ibid., 1951, **2**, 965.

FRACTURES COMPLICATING E.C.T.

Violent involuntary muscular contractions are apt to cause fractures and dislocations, and such injuries have been encountered in particular in cases of tetanus and idiopathic epilepsy. When convulsions are induced in psychiatric treatment the incidence of these complications is high. The most frequent of such injuries complicating convulsive therapy is compression fracture of one or more vetebrae, though humeral fracture and dislocation of the shoulder and temporomandibular joints have been reported also.

When convulsions are induced with metrazol the recorded incidence of vertebral fracture has varied from less than 1% to 47%. In a careful investigation of 800 patients in whom convulsions were thus induced, and in whom radiographs of the spine were taken before and after treatment, Easton and Sommers[1] record an incidence of fracture of 26.1%—the figure being 37.2% for men and 16.8% for women. In the presence of osteoporosis the incidence of fracture was doubled, and it was found that the 4th, 5th, and 6th thoracic vertebrae were those commonly injured. With electrically induced convulsions Lingley and Robbins[2] report a fracture incidence of 23% in 230 patients. In this series fractures occurred almost three times more frequently in men than in women, and the incidence was doubled in the group of patients showing osteoporosis. Meschan and others[3] report on the incidence of fractures in a group of 212 male patients, in whom a careful radiological examination was made before and during the course of electroconvulsive therapy. The incidence was 35.4%—the 3rd, 4th, and 5th thoracic vertebrae being most commonly affected; 80% of these fractures occurred during the first five treatments. They state that the fracture is often symptomless and that when back pain does occur after therapy fracture is likely to be the cause. These authors also found that the incidence of vertebral fracture was reduced to 19.5% when curare was administered. Dewald and others[4] investigated this complication in a group of 263 cases. When treatment was carried out with the muscle-relaxant drugs the incidence of fracture was 20.8%, 42% in the male and 14% in the female; when decamethonium bromide was used the fracture incidence fell to 1.9%. They find that the fracture incidence with the direct and Glissando techniques is the same and confirm the greatly increased risk of fracture in the presence of osteoporosis. Fracture usually occurred during the first three treatments, and the 4th, 5th, and 6th thoracic vertebrae were those commonly affected; all the fractures were in the dorsal region, their number in individual cases varying from 1 to 6, with an average of 2.2. Usually the fracture was a minimal compression, and in only two of 49 cases with fracture did the degree of compression exceed one-third of the original height of the vertebral body. Fracture caused no symptoms in 30.6% of the cases, and of the patients complaining of back pain after treatment 75.6% had fractures.

[1] *J. nerv. ment. Dis.*, 1944, **99**, 256.
[2] *Radiology*, 1947, **48**, 124.
[3] Ibid., 1950, **54**, 180.
[4] *J. Amer. med. Ass.*, 1954, **154**, 981.

The high incidence of vertebral fracture as a complication of convulsive therapy is clear from these studies. While the skeletal injury is usually slight and frequently not productive of symptoms, its prevention is desirable, and the use of muscle relaxants is of proved value here. Since fracture usually occurs early in treatment and the injury may become more severe with subsequent treatment, the value of prophylaxis by means of relaxants from the beginning of therapy is obvious. The greater incidence of fractures in the male would appear to be due to his more powerful muscles. It is also of interest that the vertebrae commonly injured are the 4th, 5th, and 6th dorsal. The position of these vertebrae at the height of the dorsal kyphosis, the normal slight anterior wedging of thoracic vertebral bodies, and the relatively small degree of movement normally occurring here perhaps account for the site of these fractures.

NEUROLOGICAL COMPLICATIONS OF INOCULATION

That neurological complications occasionally follow a prophylactic inoculation has been recognized for many years, and some of the more dramatic, such as post-vaccinal encephalitis, are well known. Miller and Stanton[1] have recently provided an excellent review of this subject and contribute some further detailed examples of their own. As they point out, these cases "lie in a neglected borderland between the fields of neurology, preventive medicine and paediatrics and have been the subject of many isolated case reports but of little systematic study." Their paper confirms the impression that, although uncommon, such cases are not very rare. When neurological complications do ensue, a variety of reactions can occur to any one type of inoculation, although there is a tendency for one clinical picture to be commoner than others. Thus, after serum injections such as A.T.S. a brachial radiculitis is the common pattern, while after T.A.B. it is cerebral involvement, and with pertussis inoculation convulsions are the usual type of neurological complication.

Interest in this subject has been more widespread of late because of the observation that poliomyelitis may apparently be evoked by pertussis and diphtheria inoculations. This association is specifically excluded from Miller and Stanton's review. However, the possibility that an allergic reaction may upset a symptomless symbiosis between a host-cell and an already indwelling virus will occur to many. The authors dismiss this as highly improbable, though the occurrence of differences in the clinical picture between one type of inoculation and another could as well argue for as against such a view. In deciding the point it would be helpful to know more than we do at present of the intracellular changes associated with "immunity." In general, the authors incline to the opinion that all the manifestations discussed are examples of hypersensitivity, and they marshal the evidence for this well. It may be, however, that the various neurological syndromes which occur

[1] *Quart. J. Med.*, 1954, **23**, 1.

are produced in different ways, even though allergy in the broadest sense is a common link. The wider suggestion that certain "spontaneous" neurological diseases may be similarly conditioned is certainly an interesting speculation. From the practical point of view the implications of these views for treatment are clear. The antihistamines and cortisone and A.C.T.H. should evidently be given a trial. They may serve both as treatment and as a test of the hypothesis. Here the beneficial results of cortisone in post-exanthematous encephalitis are relevant and encouraging.

This review of a somewhat neglected subject has a twofold merit. The authors bring together compendiously much scattered clinical observation, and, in interpreting it, put forward a hypothesis in a form which already suggests ways of clinical and even experimental confirmation. This is a methodological advantage often overlooked in reporting clinical observations.

FAT EMBOLISM

Fat embolism is one of the most serious complications of fractures, and also, occasionally, of operative procedures on bones. It is probably more common than is generally realized, and the less severe cases must often escape recognition. It occurs most commonly in young adults after fractures of the tibia and femur. The first symptoms, which usually present 36–48 hours after the fracture, are heralded by a sudden change in the patient's general condition. Cyanosis, dyspnoea, and pain in the chest are common, and the patient rapidly becomes restless, drowsy, or irrational, or he may pass into a deep coma. This last symptom indicates massive involvement of the cerebrum, and implies a bad prognosis. These early symptoms are usually accompanied by an equally rapid rise in temperature, pulse rate, and respiration. The sudden development of incontinence of urine was reported by Alldred[1] in six patients of a series of nine studied by him. Of the physical signs the most striking is the petechial rash which may develop over the upper chest, neck, and shoulders, sometimes spreading to the arms and lower part of the trunk. It fades quickly, but is usually present for several days. In the chest the signs are those of acute pulmonary oedema: there will be moist sounds and scattered areas of consolidation. In some cases the symptoms and physical signs are confined to the chest, and the correct diagnosis may be overlooked. Alldred reported spasticity of the limbs in one patient and hemiplegia in another, evidence that the central nervous system was affected. The diagnosis may be confirmed by the presence of fat in the sputum and urine and by radiological examination of the chest.

The treatment of fat embolism is entirely symptomatic, there being no specific measures available. Cyanosed patients should be given oxygen, which may be life-saving. It can be administered by nasal catheter, B.L.B. mask, or by placing the patient in an oxygen tent. Pulmonary infection should be controlled by antibiotics. Fluids should be administered, either by mouth or intravenously, and the restless patient will require sedation. Newman has suggested tying the profunda femoris vein, but it is doubtful if this procedure is of any value once embolism has occurred.

[1] *Brit. J. Surg.*, 1953, 41, 82.

BIRTHDAY HONOURS

The conferment of a baronetcy on Sir Russell Brain, who was knighted in 1952, is a further recognition of his great services to medicine and of the importance of his high office as President of the Royal College of Physicians of London. It is an honour which will be warmly welcomed by his friends and colleagues as a tribute to a man of many gifts and attainments who in achievement and personality upholds the traditions of the great profession he serves so unstintingly in so many ways. Mr. R. C. Brock, who is made Knight Bachelor, is known throughout the world for his remarkable contributions to the surgery of the heart and so to the relief of cardiac cripples. The report on his first six successful cases of valvulotomy for mitral stenosis was published in the *British Medical Journal* four years ago, written in a style that was a delight to read. Mr. Brock has brought renown to British surgery. As editor of the *Guy's Hospital Reports* and author of *The Life and Work of Astley Cooper*, he has taken his place in a distinguished line of scholar-surgeons. The profession in this country will acclaim the honour done to their Australian colleagues by the conferment of a knighthood on Dr. A. P. Murphy, President of the Royal Australasian College of Physicians, and on Mr. H. H. Schlink, who is consulting gynaecological surgeon to the Royal Prince Alfred Hospital, Sydney. Australia has also been honoured in the awards of C.B.E. to Dr. A. J. Metcalfe, director-general of health and director of quarantine, Canberra, and to Dr. C. J. M. Walker, member of the Medical Board and of the Board of Health, New South Wales. Dr. P. P. Lynch, a member of the Dental Council and of the Medical Research Council of New Zealand, has been appointed C.B.E. Dr. R. S. F. Hennessey, Director of Medical Services in Uganda, and Dr. Andrew Topping, Dean of the London School of Hygiene and Tropical Medicine, both receive the C.M.G. Among other medical men honoured his old colleagues will note with interest the award of the O.B.E. to Dr. E. A. Cockayne "for services to entomology," and recall his classical contribution to medical genetics: *Inherited Abnormalities of the Skin and Its Appendages*, published in 1933.

Medicine has a special affection for her "stickit" doctors, among whom Mr. Somerset Maugham, now admitted as a Companion of Honour, is *facile princeps*. Mr. Maugham entered St. Thomas's in 1892 and qualified M.R.C.S., L.R.C.P. The medical profession will wish, too, to congratulate Mr. Alfred Chester Beatty upon his knighthood. An American who became a naturalized Briton, Mr. Beatty has been a great benefactor to medicine. In 1937 he bought the old Freemasons' Hospital in Fulham and presented it to the Royal Cancer Hospital to house the well-known Chester Beatty Research Institute.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

INVESTIGATION OF HAEMOLYTIC ANAEMIA

BY

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Red cells are normally removed from the circulation within 120 days, a process which involves the daily destruction of some 2.7×10^{11} erythrocytes in a man with a blood volume of 5 litres. An equivalent number of newly formed cells are provided by the bone marrow, which is able within certain limits to increase its rate of red-cell production as required. Thus, the marrow can cope with sudden extra demands caused by abnormal red-cell destruction or loss, and the presence of a mild haemolysis may be obscured; when red-cell destruction becomes too great for full replacement to be achieved by marrow hyperplasia, then a haemolytic anaemia becomes manifest.

Clinical Types

Haemolytic anaemias form a group of blood diseases, not easy to classify, caused by a variety of intrinsic and extrinsic factors producing excessive red-cell destruction. In general, the acute or subacute haemolytic anaemias are due primarily to extrinsic factors, while most of the chronic types have familial or hereditary features and the red cells themselves may be abnormal; in the latter group we find, among others, acholuric jaundice and familial haemolytic spherocytic anaemia (with spherocytes), sickle-cell anaemia (with sickle cells), thalassaemia or Cooley's anaemia (with leptocytes or target cells).

The acute haemolytic anaemias may be caused by the toxic or haemolytic effects on the normal red cells of severe bacterial or protozoal infections—for example, septicaemia, malaria—many chemical poisons such as compounds of arsenic, lead, bismuth, silver, and phosphorus; chlorates and methyl chloride; derivatives of benzene and toluene (aniline, phenylhydrazine, acetanilide, sulphonamides); haemolytic agents such as saponin, lysolecithin, snake venom, and *Vicia fava*, the broad bean. Severe acute haemolytic anaemias also arise following incompatible blood transfusions (α and β agglutinins), the production of anti-Rh agglutinins causing, for example, erythroblastosis foetalis, and in the presence of cold iso-haemolysins. Acute or subacute haemolytic anaemia may also be a secondary feature to other conditions such as Hodgkin's disease, carcinomatosis, hypersplenism, and leukaemias among others.

While the severity of the haemolytic process may modify the symptoms, in general all these haemolytic anaemias clinically show a varying degree of jaundice and evidence of excessive red-cell destruction; there will be the usual general symptoms associated with, and proportionate to the degree of, anaemia; haemorrhagic or haemolytic manifestations may occur, and pigment gall-stones are common. Pyrexia, malaise, headaches, and haemoglobinuria may be noted; the spleen is often enlarged, the liver less often, and occasionally also the lymph nodes. Glossitis, neurological symptoms and signs, and flatulent dyspepsia are not seen, in contrast to their occurrence in pernicious anaemia, although sometimes there are other gastro-intestinal disturbances. In mild cases, on superficial clinical examination, the patient may appear to be suffering from pernicious anaemia or cholecystitis until blood and other examinations have disclosed the true condition.

The essential laboratory investigations in a case of haemolytic anaemia include a full blood count with estimation of daily reticulocytes, estimation of the osmotic fragility of the red cells, bone-marrow biopsy, examination of the gastric juice, and a search for abnormal agglutinins in the blood. Subsidiary tests may include estimations of faecal and urinary urobilinogen, and special tests for specific agglutinins or other haemolytic factors.

Blood Count and Osmotic Fragility

It is important to make a full blood examination, including reticulocyte and differential white-cell counts and an estimation of the osmotic fragility of the red cells. The anaemia, which is usually macrocytic but may be normocytic or less commonly microcytic, may be severe (R.B.C. 1,000,000 to 2,000,000, and Hb 2.3 to 5.9 g. per 100 ml.). The severity varies with intermittent remissions and frequent crises. One of the most striking and diagnostic features is the notable reticulocytosis (10 to 80%) that may persist with varying severity for many months or years. Reticulocytosis with anaemia, in the absence of haemorrhage or treatment with liver, iron, etc., and persisting for weeks or months despite treatment, is almost pathognomonic of a haemolytic anaemia. It is common to find normoblasts, but rarely megaloblasts, in the peripheral blood. Many of the red cells have a bluish tinge (polychromasia) reflecting their immaturity. Small darkly staining red cells (microspherocytes) are often seen in acholuric jaundice.

The osmotic fragility of the red cells varies in different patients, and the sizes and shapes of the cells depend on the particular type of anaemia. An accurate quantitative fragility test is necessary to detect the mild forms of chronic haemolytic anaemia (acholuric jaundice). The old method of reading the haemolysis visually is inaccurate and has been replaced by the quantitative method of estimating the liberated haemoglobin in the various hypotonic solutions by means of a photoelectric colorimeter. While a significant increase in the red-cell osmotic fragility is pathognomonic of a haemolytic anaemia it does not indicate the particular type other than a spherocytic haemolytic anaemia; a variable increase is found in many but not in all haemolytic anaemias of acquired type, as well as in the classical familial chronic type.

A slight leucocytosis or occasionally a leucopenia with a few immature white cells (myelocytes and myeloblasts) may be seen, perhaps occasioning some difficulty in differentiating the condition from acute leukaemia. The marrow picture in these cases is of great value, for the absence of a significant number of "blast" or "stem" cells excludes an acute leukaemia. The platelets are usually normal in number but may be decreased in patients in whom haemorrhages are occurring.

To demonstrate sickle cells it is necessary to reduce the oxygen tension of the blood by sealing a drop under a cover-slip; sickle-cell haemoglobin becomes crystalline with deoxygenation, loses water during the process of crystallization, and so changes its shape and becomes sickle-shaped. A person in whose blood sickle cells can be demonstrated, but who shows no obvious signs of haemolysis, is said to have the sickle-cell trait. In thalassaemia (Cooley's anaemia) many of the red cells have a "target appearance" (target

cells); adults usually exhibit mild or symptomless forms known as thalassaemia minor; the complete major disease is usually fatal in childhood.

Bone-marrow Biopsy

Examination of the marrow is a necessary step in the diagnosis of many of the haemolytic anaemias, for it helps to exclude leukaemia, pernicious anaemia, and other conditions having similar clinical and blood findings. In haemolytic anaemia there is a marked hyperplastic marrow reaction with large numbers of early basophilic, intermediate, and late normoblasts. Proerythroblasts may also be increased in number. In the long-standing haemolytic anaemias the normoblasts may show changes in nucleus and cytoplasmic details that differ somewhat from those seen in other macrocytic anaemias, for there may be many mitoses present in the prematurely haemoglobinized cells. The myeloid–erythroid ratio is often less than unity, the total nucleated red cells constituting 60 to 80% of the total nucleated count. Megaloblasts are rarely found. Activity in the granulocytic and megakaryocytic series may be observed, although there may be a total reduction in their number.

Blood Pigments

A normal serum does not give a direct van den Bergh reaction and contains not more than 1 mg. of bilirubin per 100 ml. In haemolytic diseases, jaundice is due to the liver cells being unable to excrete fast enough the increased bilirubin formed from the excessive breakdown of haemoglobin. The van den Bergh reaction is based on the hypothesis that bilirubin reacts differently with the diazo-reagent according to whether or not it has been excreted by the liver cells. Bilirubin formed from haemoglobin has been termed *indirect* bilirubin, since it does not give an immediate direct reaction. Bilirubin which has been excreted by the liver cells (as is found in the blood in obstructive jaundice) gives an immediate direct reaction and has been termed *direct* bilirubin. In haemolytic jaundice there is an increase in *indirect* bilirubin so that indirect reactions or direct delayed reactions are obtained. In some forms of haemolytic disease the agent acting on the red cells may also have a toxic action on the liver cells, in which case a biphasic reaction may be reported.

In acholuric jaundice the serum bilirubin may rise as high as 16 mg. per 100 ml., and in some forms of acute haemolytic anaemia similar or higher values may be obtained. The quantitative estimation of serum bilirubin is useful in subclinical jaundice, the demonstration of small increases in serum bilirubin to between 1 and 2 mg. per 100 ml. is usually of diagnostic value. When intravascular haemolysis is rapid, haemoglobin and methaemalbumin are found in the peripheral blood. This occurs in some severe haemolytic anaemias (blackwater fever, septicaemia, incompatible transfusion) and in the paroxysmal haemoglobinurias.

Haemoglobin appears in the urine when the plasma level is over about 130 mg. per 100 ml. Haemoglobin liberated in the plasma is partly excreted as haemoglobin in the urine, and some is converted into methaemalbumin. The presence of methaemalbumin in the serum shows that intravascular haemolysis has occurred. Methaemalbumin does not appear to be formed when there is increased breakdown of haemoglobin in the reticulo-endothelial system. It is found in the plasma in malaria, and in many of the acute haemolytic anaemias in which the haemolysis is intravascular, but not in acholuric jaundice and such conditions in which the haemolysis is non-vascular. Methaemalbumin has a large molecule and is excreted by the liver as coproporphyrin III.

Urinary and Faecal Urobilinogen

Urobilinogen is formed in the intestines by the reduction of bilirubin, and thus the amount of faecal urobilinogen depends on the amount of bilirubin entering the intestines.

Faecal urobilinogen (normal 40–280 mg. a day) is increased in haemolytic anaemias in which there is increased breakdown of haemoglobin to bilirubin. In acholuric jaundice and chronic haemolytic anaemias values of 500 to 1,500 mg. may be obtained. The dark colour of the faeces in these conditions is due to the large amount of pigment present.

Urinary urobilinogen (normal 0.5–2 mg. a day) is derived from the urobilinogen absorbed from the intestines and not excreted by the liver. The amount depends both on the quantity of bilirubin entering the intestines and on the capacity of the liver to excrete the urobilinogen coming to it from the intestines. In haemolytic diseases the urinary urobilinogen tends to be a little raised, since the liver is unable completely to excrete the increased amounts of urobilinogen absorbed from the intestines. Values up to 10 mg. a day are usually found.

Whenever there is active blood regeneration in the haemolytic anaemias coproporphyrin I appears in the faeces. In compensated haemolytic disease in which there is no appreciable anaemia an increased excretion of faecal urobilinogen may be the only confirmatory evidence of a haemolytic process.

The *haemolytic index* (normal 11–20) is sometimes determined in children, in whom the total circulating haemoglobin is less than in adults. The index is found from the following equation:

$$\frac{\text{Average daily output of faecal urobilinogen} \times 100}{\text{Total Hb (g. per 100 ml.)} \times \frac{\text{Total blood volume}}{100}}$$

It is a time-consuming investigation and is seldom used for routine clinical work.

Auto-immunization

The cause of the haemolytic state in a variety of diseases is the production of antibodies against the patient's own red cells (auto-antibodies). In many of these cases no reason for this can be demonstrated, but in others an associated disease is found and in these the condition is symptomatic. Many of the reticuloses, chronic lymphatic leukaemia, Hodgkin's disease, periarteritis nodosa, and disseminated lupus erythematosus are primary causes of auto-immune haemolytic disease.

The way in which antibodies bring about haemolysis is not certain. In some cases haemolysins appear which produce haemolysis in the presence of complement. In others, with a high concentration of cold haemagglutinins, haemolysis occurs after cooling. The abnormal antibody in most cases of acquired haemolytic disease is a haemagglutinin which can be demonstrated by the Coombs test or by suspending the sensitized cells in a protein medium (bovine albumin). The nature of these antibodies is such that agglutination will not take place if saline is used as the medium for suspending the red cells.

The Coombs test is used to detect the presence of incomplete antibodies* in the serum and to help in the diagnosis of haemolytic disease of the newborn by demonstrating that the infant's corpuscles have absorbed the antibody. To identify such antibodies Coombs prepared an anti-human globulin serum by injecting human globulin into rabbits. When red cells sensitized by a non-agglutinating antibody are washed in saline and then suspended in the antiglobulin serum they become agglutinated.

In most cases of idiopathic acquired haemolytic anaemia the Coombs test is positive, indicating the presence of globulin antibodies adsorbed to the surface of the red cells, and in these cases no agglutination occurs in saline–serum suspensions. Agglutination may also be demonstrated by suspending the cells in a colloid such as bovine albumin, but the Coombs test is thought to be more sensitive and is more commonly employed.

Trypsinized red cells were found to be good indicators of incomplete antibodies, and do not require a protein medium

*An antibody that agglutinates red cells only in the presence of albumin or plasma and in the absence of sodium chloride.

for suspending the cells. Many of the abnormal incomplete agglutinins are haemolytic when incubated with complement against trypsinized red cells.

Haemoglobinuria

Patients with haemoglobinuria have a haemolytic disease and present many of the features associated with the haemolytic syndrome. Several varieties of paroxysmal cold haemoglobinuria are recognized.

With a Cold Auto-haemolysin.—This type occurs most frequently as a complication of syphilis, either congenital or acquired. It is characterized by haemoglobinuria following exposure to cold. The Donath–Landsteiner test is diagnostic of cold haemoglobinuria. In this test, red cells suspended in the patient's serum are exposed to a low temperature so that the cold haemolysin may be absorbed, and then to a higher temperature so that haemolysis may be completed by the action of the serum complement. Normal red cells can be used in this test. In life the haemolysin becomes fixed to the red-cell surface during exposure to low temperatures, and when the blood circulates and becomes warmer haemolysis occurs.

With Cold Agglutinins.—Raynaud's syndrome, with acrocyanosis and pain in the extremities, may occur in paroxysmal cold haemoglobinuria associated with cold agglutinins. When titrated, the cold haemagglutinin may exceed 1/1,000 and rarely be demonstrated at up to 1/100,000. Cold haemagglutinins have been found in a number of conditions not necessarily associated with demonstrable haemolytic disease. In atypical pneumonia, for instance, they are often reported to be present.

Paroxysmal Nocturnal Haemoglobinuria

In this chronic haemolytic disease, haemolysis becomes intensified during sleep and nocturnal haemoglobinuria occurs. The patient's corpuscles are sensitive to thermolabile components of normal serum, but acidification is necessary to bring the *p*H of the cell-serum suspension to about *p*H 6.8 before the serum factors will act. This is the principle of the Ham test which is employed to diagnose this condition. Acidification is necessary because defibrinated blood becomes slightly alkaline owing to loss of carbon dioxide. Clinically, patients with nocturnal haemoglobinuria show an abnormal sensitivity to minor changes in blood *p*H. This may also be a factor in other haemolytic mechanisms.

Next Article on Clinical Pathology.—"Polycythaemia, Leukaemia, and Cytopenia," by Dr. Ronald Bodley Scott.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

According to the Eighth Annual Report of the Institute of Child Health, the number of full-time students in 1953 was just under one hundred and there were also 40 part-time students. While most of the students attending were from the Commonwealth, it is interesting to note that 14 full-time students were from countries outside the British Empire. This perhaps signifies the growing importance of London as a postgraduate centre. More emphasis was laid in 1953 on clinical instruction. The number of lectures was reduced and opportunities were provided for increased ward teaching. Arrangements were made for small groups of two or three students to "sit in" with registrars during the out-patient sessions.

BEDSIDE MANNERS

BY

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A dermatologist told the following story. A patient came to him with eczema in one axilla. A previous doctor had told the patient that the eczema was due to sweating. "I sweat here and I sweat there," the patient argued, pointing to his two axillae; "how can the eczema be due to sweating?" "What do you think it is due to?" the dermatologist asked. "I believe," the patient said, "that it is due to sugar diabetes." "You would have sugar diabetes here and there," the doctor said, pointing to the patient's two axillae, hence you can't have sugar diabetes." Subsequently the patient felt greatly relieved, and incidentally the eczema disappeared. The patient was extremely grateful.

This story serves to introduce the subject of this paper—"bedside manners" and psychotherapy. Bedside manners may be defined as an unsystematized understanding of a patient's emotional needs, whereas psychotherapy is their conscious systematized counterpart.

Systematic psychotherapy is predominantly the domain of the psychiatrist; bedside manners is a term applied to the intuitive approach used by general practitioners and specialists not specifically trained in psychiatry. Both bedside manners and psychotherapy are based on interaction between patient and doctor. It is proposed to discuss some of the more common psychological problems of patients and doctors, and some principles governing reciprocal physician–patient relationships.

The Patient

A patient is a person who seeks the help of a physician because he deviates in mental or physical health from the norm. He is not necessarily a sufferer as the word patient connotes. In view of his sickness a patient has to assume a role which imposes on him in many cases the necessity of forgoing his usual activities, of retiring to bed, and of accepting another person's help to restore him to his previous state of health. If he is very sick he may have to abandon his functional status of an adult and perhaps be attended to in a baby-like fashion.

Research in psychosomatic medicine has shown that emotional factors often play an important part in the aetiology of so-called "organic" diseases. Be this as it may, in any given patient illness as such, and the change in mode of living which it comprises, leads to a backward movement towards earlier stages of emotional development and behaviour. This state of regression, as it is called, manifested by changed attitude and feelings, is particularly significant in chronic illness. It may have the following interrelated effects: (1) patients may become childish in their behaviour; (2) they may, and usually do, become selfish; (3) they may invest the interest which they withdraw from the external world on the affected part of the body and consequently develop superadded hysterical or hypochondriacal formations; (4) they may distort reality

in other ways—for example, by wishful self-deception about their own unmistakable condition; and (5) they may manifest towards the physician positive or negative feelings of great intensity patterned after those experienced towards their parents, particularly their fathers. This mechanism is often operative in patients who show apparently irrational awe, subservience, hostility, panic, anxiety, dependence, or affection towards their physicians. If the unconscious sources of these reactions are not recognized the physician may respond inappropriately and trammel up rather than facilitate the physician–patient relationship.

Illness of necessity affects a person's mood. Dependent on the nature, site, and severity of the illness, on his previous personality and past experience, feelings of depression and of anxiety are commonly experienced. These emotions may be appropriate responses; or they may be inappropriate or at least disproportionate to the actual condition. In the latter case, feelings of badness and of unworthiness which previously existed may be subjectively experienced by the presence and "badness" of the illness; or fear of punishment for previous misdemeanour may disproportionately intensify justifiable fear regarding the outcome of the illness. Psychological defences against feelings of depression and of anxiety are denial and projection. Denial may take the form of unreasonable—and often foolhardy—defiance of obvious handicaps, or it may find expression in false optimism or jocularity, so commonly encountered in incurable illness or in the terminal stages of illness. Patients may project resentment at their own condition or their environment, or they may fasten their internal anxieties on some external event such as an impending operation. The word "complaint," not only in its colloquial but also in its medical usage, signifies dissatisfaction. Consciously or unconsciously, patients may complain about their suffering, their pain, their fate, or about the lack of attention or affection which they sorely need.

Illness mobilizes aggressiveness, which may be due to inability to accept dependency or any imposed restrictions or frustrations. No longer is the patient able to discharge his duties, to earn his wages, or to enjoy sports and other pleasures. He may be restricted in body movement or debarred from items of food which he previously relished. No wonder that many a patient becomes irritable and irritating. Whether or not he freely expresses or checks aggressiveness engendered in this way depends on patterns of behaviour established in the past and proved to be useful. The patient who pathetically appeals to us for sympathy may achieve his ends just as successfully as the old arthritic lady who angrily thumps a stick on the floor if her wishes are not immediately fulfilled.

The patient's environment responds to his moods, anxieties, needs, demands, and reactive aggressiveness, and as these responses are fed back to the patient a vicious circle may well be established. Usually people feel sorry for a person afflicted by illness; after all, it could happen to them, and should it happen to them they would like to be cared for tenderly. But as the illness drags on, and the demands of the patient continue, and the economic strain makes itself felt, the patient feels a burden and is felt as such by others. Members of his family and good friends may still cover up their resentment and hostility by lavishing gifts and apparent over-kindness, but, especially if previous bonds had not been close, the veneer may wear thin and crack. Unfortunate are the marriages which have been broken up by the serious prolonged illness of husband or wife.

The Physician

Are doctors always fully aware of their patients' needs and anxieties and of the many problems and conflictual situations which exist in their patients' families and may be produced or developed by their illness?

Let us look for a moment at the doctor's problems and "dilemma." There are many reasons why a person becomes a doctor—for example, a doctor is highly respected in the community, and, provided that he is competent, he earns a reasonable income. Hidden behind conscious altruistic wishes to serve his fellow men, four psychological factors seem to play a part in the choice of the medical profession: (1) identification, (2) sublimated infantile curiosity, (3) sublimated and/or overcompensated aggression, and (4) persistence of infantile omnipotence fantasies.

Identification may be positive or negative. A person may become a doctor because he wants to emulate his father, who is a doctor, or because he wants to rise in the social scale above his father, who is a tradesman or owns a small business. We all played the doctor's game as children. Instinctual trends operative then may have been carried over into adult life and canalized into professional interests. Sadistic trends dating back to childhood may find sublimated expression in surgical skill or may be warded off and overcompensated by concentration and devotion to healing.

Most doctors derive much satisfaction from helping suffering humanity, but little do many doctors realize that beyond reasonable ambitiousness their wish to score success, especially where others have failed, is based on a perpetuation of infantile omnipotence fantasies.

Each of the factors mentioned may give rise to difficulties. For instance, we all know doctors whose attempts to identify with a successful father or older brother have miscarried or who could not allow themselves to outstrip their father's modest achievements or live up to their mother's overambitious expectations. There are doctors who had to give up surgical interests or even a promising career as a surgeon because of their inability to inflict pain or to be held responsible for the death of some of their patients. How commonly are doctors afraid of giving bad news to their patients when telling the truth and nothing but the truth would obviously be right? Why do we sometimes act in this manner? We act in this manner because cultural pressures do not allow us to tolerate free display of emotion in ourselves and in others, because we tend to identify ourselves with our incurable patients, because we are averse to inflicting pain, and because our vanity makes it difficult to admit failure. Let us admit—at least to ourselves—our limitations instead of reaching out for and taking on tasks beyond our capacities, and instead of basking in the glory of our therapeutic successes.

Some Problems

There are other problems which beset the medical practitioner.

(1) The doctor, analogous to the patient's closest kin and friends, is a person who can be trusted with the most private and intimate affairs and feelings of the patient. But at the same time the doctor does not admit his patients to intimacies with himself, does not "reveal" himself to the patient, physically or mentally. If he happens to be a personal friend of the patient he will be well advised to segregate the two roles.

(2) The doctor's "trustworthiness" and authority are based on his assumed technical competence. This technical competence, in accordance with the patient's wish to be cured and in keeping with his regressive state, is exaggerated out of proportion. Any situation or occasion which shatters the patient's primitive belief in the doctor's magic powers accentuates previously hidden negative feelings and doubts and may lead to change of doctor in the partly rational and partly irrational hope of finding someone who can repair what perhaps cannot be repaired.

(3) The doctor is an authority and wields authority as a technical expert. He can give "orders" but is in no position to enforce them or to penalize a patient for not carrying them out. His authority is strictly segmental in nature; it is confined exclusively to matters concerning the patient's health. He can impose restrictions in diet and on physical activities. He can sometimes justifiably counsel a change in occupation, but he trespasses on his legitimate rights and does more harm than good by telling a patient that all she needs is a husband, a child, or sexual intercourse.

(4) A doctor should treat his patients equally, regardless of colour, creed, nationality, social and economic status, or other distinctive features. But who of us has not been influenced at one time or another by the appearance and manners of his patients, or by their social status in the community? And who of us has not been guilty at times of giving more careful attention to a wealthy patient than to an indigent one?

(5) A doctor is supposed to assist the needy irrespective of monetary gains; but we also have to live and support our families. Moreover, living as we do in an acquisitive society with keen and often unscrupulous competitiveness, monetary gain is frequently regarded as a sign of success and as a means of much-needed recognition. Consequently the temptation is often great to place self-interest before the interest of the patients, to promise "miracle cures" against better knowledge, to prescribe injections which are not needed, or to play up to the patient's requests for gadgets which may not be required. Perhaps there is more than a grain of truth in the charge that the Hippocratic oath is in danger of being replaced by salesmanship based on the "get-rich-quick" principle.

(6) The doctor, like his patients, has unconscious conflicts which may interfere with his capacity to understand and treat his patients. For example, doctors unable to recognize their own shortcomings may be unable to tolerate similar inadequacies in their patients. Detached, aloof physicians may be threatened by patients' attempts to form close, dependent relationships with them. Other physicians may become unduly attached to or over-identified with patients whose problems are similar to their own, or whose personalities resemble those of relatives with whom they have intense relationships.

Physician–Patient Relationships

From this background discussion of patients and physicians we may return now to the principal topic—bedside manners. The points which we have been trying to make are: (*a*) that the practice of medicine not only consists in the application of biological knowledge but also demands considerable degrees of social and psychological understanding, described as bedside manners and psychotherapy; (*b*) that certain definable principles can be identified and are operative in bedside manners; and (*c*) that, analogous to systematic psychotherapy, bedside manners require an intimate knowledge and understanding of the emotional, social, and economic problems of the patients and their families as well as those of the doctors themselves. The classic dictum "know thyself" is an essential prerequisite for the knowing of others. From time immemorial good doctors have always paid attention to the emotional aspects and the environmental stresses of their patients. To do so, general practitioners are in a better position than consultants, who, in view of their special functions, do not see their patients over prolonged periods in their home environments. Few doctors would fail to listen to a patient's chest in a case of prolonged coughing, but many doctors fail to listen to their patients' words, which may reveal more than auscultation ever can.

Rather than speak to their clergymen, in whose presence they may feel embarrassed, patients often take their troubles and worries to the general practitioner, who is well advised to listen patiently and benevolently without taking sides, showing disapproval, or giving advice. The very fact that the patient can "get it off his chest" relieves feelings of tension and anxiety.

Psychological examination and assessment require skill and time. Yet the time factor is often overrated. Just as the beginner spends more time on a physical examination than an experienced physician, psychiatric appraisal takes less time as experience grows. One may listen for hours to a person who speaks Chinese, but would not understand a word unless one had learned the language. Symptoms are the language of disease, and behaviour is even more specifically the language of psychological disorder. Physicians can familiarize themselves with the varying ways in which patients communicate their emotional discomfort and indicate their need for help. Not infrequently the presenting complaint is only a plausible excuse couched in the language of somatic symptoms, to indicate the patient's general distress. The source of this distress—that is, its emotional and conflictual origin—may be confused readily with its somatic localization.

Time, money, and effort could be saved if patients suffering from psychosomatic and psychoneurotic illness would not again and again be submitted to elaborate laboratory examinations. Overemphasis on minor organic lesions fosters iatrogenic illness and may by-pass the real cause of the patient's suffering. The presence of emotional conflicts whose aetiological relevance to the illness may be all-important can be revealed only by direct examination. Familiarity with the basic principles of psychopathology is essential if one wants to understand one's patients' needs, anxieties, misconceptions, faulty attitudes, and psychological defences. A patient's heroic or stoic attitude towards his illness may be most impressive but may conceal a great deal of anxiety.

In keeping with their regressive states and wishes for recovery, patients suffering from prolonged and serious illnesses are apt to elevate their doctor to the position of a god. Doctors are well advised not to be taken in by the flattery and to behave as such. Doctors should realize their limitations but need not admit them to their patients. A pose of omnipotence and omniscience, if recognized as such, may be appropriate in the case of emotionally immature, anxious, or severely regressed patients, but would obviously be out of place with mature individuals who like to know where they stand.

Methods of approach naturally have to vary from patient to patient. By and large, it is true that the "don't worry," "take-it-easy," "pull-yourself-together," or "cheer-up-old-man" approaches are ineffectual. Patients may have plenty to worry about, and if they could pull themselves together they certainly would. Equally, the general practitioner may defeat his objectives by telling psychoneurotic patients that there is "nothing the matter," or that "it is all imagination." If there were "nothing the matter" the patient would hardly consult him. Nor can much benefit be expected from vacations, sedatives, or placebos, which obviously do not solve the patient's conflicts.

Constructive help can be offered by an understanding of the family situation. As has been stated before, the patient's illness affects his family, and their conscious and unconscious responses reverberate in the patient's physical and mental condition. In this respect, a thorough knowledge of community resources through which changes may be effected is obviously essential.

Conclusion

Another story may give added emphasis to the principal points of this paper. Some time ago the charming young wife of a doctor sought help for severe and intractable vomiting. Her case had puzzled many doctors. She had been submitted to elaborate examinations of her stomach, of her gall-bladder, and of her pancreas; chronic pancreatitis had been suspected. She had spent many months in bed and had been placed on a very rigid diet, all without benefit.

Had one of her physicians spent 10 minutes talking to the patient he would have found out that this young woman felt neglected by her husband. She entered marriage knowing full well that much of her husband's time would be taken up by his flourishing practice. But she had failed to realize that he would devote himself, almost to the exclusion of everything else, to his patients. She was frankly jealous of his patients. If she wanted to attract his interest and attention there was nothing left but to be a patient herself, and an interesting patient at that. When this unconscious mechanism was made conscious to her she recovered rapidly. Needless to say, when her husband recognized her motivation his attitude towards her changed.

The annual competition of the Manchester and District Medical Golfers' Association was held on the course at Wilmslow on May 19. There were 57 competitors. The challenge cup was won by Dr. J. J. MANNING (Warrington) with a net score of 70. The Walter gold medal was awarded to Dr. R. W. FAIRBROTHER (Wilmslow) with the best gross score of 77, and Dr. D. C. ATTWOOD (Bolton) secured the Captain's prize for the second best net score of 73.

MEDICAL BIRTHDAY HONOURS

The names of the following members of the medical profession were included in a Birthday Honours List published in *Supplements* to the *London Gazette* on June 10:

Baronetcy

Sir WALTER RUSSELL BRAIN, D.M. President of the Royal College of Physicians of London. Physician to the London Hospital and the Maida Vale Hospital for Nervous Diseases.

Companion of Honour

WILLIAM SOMERSET MAUGHAM, Hon.D.Litt., M.R.C.S., L.R.C.P. Author and dramatist.

Knighthood

RUSSELL CLAUDE BROCK, M.S., F.R.C.S. Surgeon, Guy's Hospital and Brompton Hospital.

ALEXANDER PATERSON MURPHY, *M.C.*, M.D. President of the Royal Australasian College of Physicians.

HERBERT HENRY SCHLINK, M.B., Ch.M., F.R.A.C.S., F.R.C.O.G. Consulting Gynaecological Surgeon, Royal Prince Alfred Hospital, Sydney, New South Wales.

C.B. (Military Division)

WILLIAM ALEXANDER DUNCAN DRUMMOND, C.B.E., F.R.C.S., D.L.O. Major-General (temporary), late R.A.M.C.

RICHARD MURPHY, C.B.E., M.B., B.Ch. Major-General, late R.A.M.C. Honorary Surgeon to the Queen.

C.M.G.

ROBERT SAMUEL FLEMING HENNESSEY, M.D., F.R.C.P.I., D.T.M.&H., Dip. Bact. Director of Medical Services, Uganda, Colonial Medical Service.

ANDREW TOPPING, M.D., F.R.C.P., D.P.H. Dean of the London School of Hygiene and Tropical Medicine.

C.B.E. (Civil Division)

CHETWYND JOHN PERSHALL GROSVENOR, M.B., B.Chir. Principal Medical Officer, Ministry of Pensions and National Insurance.

JOHN LEWIS ANDERTON GROUT, *M.C.*, F.R.C.S.Ed., F.F.R., D.M.R.E. Senior Consultant Radiologist to the Sheffield United Hospitals.

MAXWELL SHAW JONES, M.D., M.R.C.P.Ed., D.P.M. Director, Social Rehabilitation Unit, Belmont Hospital, Sutton, Surrey.

NEVILLE LANGDON LLOYD, M.B., B.S., M.R.C.P. Chief Medical Officer, Ministry of Supply.

PHILIP PATRICK LYNCH, M.D., F.R.A.C.P. A member of the Dental Council and of the Medical Research Council of New Zealand.

ARTHUR JOHN METCALFE, M.B., Ch.M. Director-General of Health and Director of Quarantine, Canberra, Australia.

CECIL JULIAN MANNING WALTERS, M.B., Ch.M., F.R.A.C.S. Member of the Medical Board and of the Board of Health, State of New South Wales.

O.B.E. (Military Division)

GEORGE LUSH FOSS, V.R.D., M.D. Surgeon Commander, R.N.V.R.

MARK JOHN LINDSEY, *M.C.*, T.D., M.B., B.S. Brevet Colonel, R.A.M.C., T.A. (now T.A.R.O.)

HERBERT CLIFFORD SERASINGHE, E.D., L.M.S. Lieutenant-Colonel, Ceylon Army Medical Corps.

ROBERT ALEXANDER STEPHEN, M.D., F.R.C.S. Lieutenant-Colonel, R.A.M.C.

O.B.E. (Civil Division)

RICHARD FRANK BOLT, M.R.C.S., L.R.C.P. Chairman, Willesden (No. 4) Medical Recruiting Board.

NOEL HAWLEY MICHAEL BURKE, M.R.C.S., L.R.C.P., D.P.M., D.M.R.E. Lately Medical Superintendent, Cell Barnes Hospital, St. Albans.

EDWARD ALFRED COCKAYNE, D.M., F.R.C.P. For services to entomology.

JOHN EDGAR DAVIES, *M.C.*, M.R.C.S., L.R.C.P., L.D.S. R.C.S. Senior Medical Officer (Wales), Ministry of Pensions and National Insurance.

MICHAEL GELFAND, M.D., F.R.C.P., D.P.H., D.M.R. For services to medicine in Southern Rhodesia.

DESMOND GEORGE MCCAULLY, M.B., B.Ch. Lieutenant-Colonel, I.M.S. (ret.). Medical Officer for the Trucial Coast, Persian Gulf.

IAN GREGOR MACGREGOR, M.B., Ch.B., F.R.C.S.Ed., D.T.M.&H. Senior Specialist, Nigeria, Colonial Medical Service.

EUGENE PIERRE LARNACH MASSON, M.B., Ch.B., D.P.M. Superintending Medical Officer (Specialist), St. Ann's Mental Hospital, Port of Spain, Trinidad.

EVERARD ARNOLD MILLS, M.B., Ch.B. Professor of Bacteriology in the Royal College of Medicine, Bagdad.

DOUGLAS WILLIAM LEIGH PARKER, M.Ch.Orth., F.R.C.S.Ed., F.R.A.C.S. Director of Orthopaedic Services, State of Tasmania.

BERNARD THOMAS SQUIRES, D.M. Medical Officer, Bechuanaland Protectorate.

ROBERT STANLEY STEEL, M.B., Ch.M., F.R.A.C.P., M.R.C.P. Commissioner of the St. John Ambulance Brigade, State of New South Wales.

JAMES TAYLOR, M.B., Ch.B., D.P.H., D.T.M.&H. Director of Medical Services, Seychelles, Colonial Medical Service.

ARTHUR WAI-TAK WOO, M.B., B.S., F.R.C.S. For public services in Hong Kong.

M.B.E. (Military Division)

STANLEY GEOFFREY FOX LINTON, M.R.C.S., L.R.C.P. Surgeon Lieutenant-Commander, R.N.

JOHN FOSTER FENTON ROONEY, M.B., B.Chir. Major (temporary), R.A.M.C. In recognition of services in Korea during the period July 28, 1953, to January 31, 1954.

M.B.E. (Civil Division)

GERALD HENRY COORAY, M.D., D.T.M.&H. Professor of Pathology in the University of Ceylon.

ISABEL MARY AGNES DOEG, M.B., Ch.B. Lady Medical Officer, Bahrain Government.

GOPAL KONDOPANT JOSHI, L.C.P.S. Senior Sub-assistant Surgeon, Medical Department, Nyasaland.

ROYAL MEDICAL BENEVOLENT FUND

The annual general meeting of the Royal Medical Benevolent Fund was held on June 4, with Lord WEBB-JOHNSON in the chair. Dr. R. COVE-SMITH, the honorary secretary, said that during 1953 the total charitable distribution of the Fund amounted to £46,897. No appeal for money was made to the general public. The income of the Fund was derived entirely from the medical profession itself by way of subscriptions, covenant deeds, donations, and legacies, and from interest on the capital which the Fund had succeeded over the years in building up. The overhead or administrative expenses were down to 6%, which excellent result was due to the efficiency of the staff.

On the proposition of Sir ZACHARY COPE the officers nominated by the committee of management were elected—namely, Lord Webb-Johnson as President, Mr. F. A. Juler as Honorary Treasurer, and Dr. R. Cove-Smith as Honorary Secretary. The retiring members of the committee were also re-elected.

A Subscribers' List

Lord WEBB-JOHNSON made certain suggestions for the study of the management committee. One was that, if possible and not too expensive, a list of subscribers should be published, partly with the object of going after those whose names were not on the list. Members of hospital staffs—especially teaching hospitals—should be written to, if they were not already subscribers, suggesting that they should become such. He had himself done this to some extent, with very good results, including three covenants from new people in one medical school only.

A vote of thanks was accorded to Mrs. Rayner, who is retiring from work at Westmoreland Lodge, Wimbledon Common—a home for doctors' widows or daughters who were not infirm, which was established in 1946 by the generosity of the late Dr. Arthur Holdsworth, the first benefactor. Mrs. Rayner, said Lord Webb-Johnson, had done wonderful work and would be greatly missed.

Other recipients of votes of thanks were the B.M.A. Charities Committee, the honorary auditors and solicitors, and the Ladies' Guild. The Guild, said Lord Webb-Johnson, did personal work that could not be done by letter and made the Benevolent Fund a live body. Bene-

ficiaries felt that there was a personal link between them and the ladies who had helped them so much.

The brief proceedings concluded with a vote of thanks to Lord Webb-Johnson for his great services as president.

MEDICAL SERVICE ON WINGS

THE AUSTRALIAN "FLYING DOCTOR"

[FROM OUR OWN REPORTER]

Dr. Allan Vickers, senior medical officer of the Australian Flying Doctor Service, is on an extended visit to this country, undertaking postgraduate study with the aid of a Nuffield Foundation grant, and also seeking to make known the facts of the Flying Doctor organization for the benefit of other parts of the British Commonwealth where a similar medical service might usefully be provided. He sees no reason why there should not be autonomous services on the Australian pattern, with co-ordinating headquarters in London, for territories where stretches of continent or intervening seas make it difficult to bring prompt medical aid. Dr. Vickers, who has been on the service for 24 years, during the last 10 of which he has operated from Charleville in south-central Queensland, says that for some time past inquiries have been reaching Australia from other countries.

Australia, with its immense territories sparsely populated, is the pioneer in this field. Its experience goes back for a quarter of a century, and it is still virtually the only country to have a service where the doctor systematically goes out by plane to see patients.

The progenitor of the service was a Presbyterian minister, John Flynn, who died three years ago. He had no more than a layman's knowledge of medicine, aviation, or radio—the tripod on which the service rests—but he had a knack of choosing doctors and engineers who translated his vision into reality. Only after the first world war did aeroplanes of a suitable type, containing a cabin in which a patient on a stretcher could be carried, become available, and even then there remained the problem of communication of messages. The telephone was not the answer; it would have been hopelessly expensive and subject to accident. A radio engineer, A. H. Traeger, of Adelaide, developed a portable transmitting–receiving set, the power being supplied by a treadle dynamo, simple enough for people in the bush to operate, and sturdy enough to stand up to its job. The man or woman at the outpost has only to use the pedal set to have a two-way talk with the doctor at the base station hundreds of miles away.

Medical advice is now given on the radio on more than 5.000 occasions in a year. The first actual flight was made from Cloncurry, Queensland, in 1928. In that year 50 flights were made, each averaging 400 miles, 255 patients were seen, and the first radio "mother" station was established, the first link in an aerial service which now covers two-thirds of the continent. The number of Flying Doctor bases is now 9, and with them are connected many hundreds of outposts (926 is the latest figure).

Control and Cost of the Service

The service was at first under the control of the Australian Inland Mission of the Presbyterian Church, but as it developed the Mission relinquished its control (though not its interest), and in 1933 in the capital of each State there was set up an executive council, consisting of persons in public and commercial life who serve in an honorary capacity. The co-operation of many bodies, such as chambers of commerce and women's institutes, and including the Federal Council of the British Medical Association in Australia, has been warmly forthcoming. Each section has been formed into a non-profit-making company, with articles of association, identical in every State, the first of which recites the objective "to foster, develop, and safeguard the health of residents in the sparsely populated areas of the Commonwealth of Australia, its dependencies and mandated territories, by ensuring readily available medical and nursing facilities. . . ." In Western Australia, in addition to the section based on Perth, there is another, serving the eastern goldfields, based on Kalgoorlie. The smallest State, Victoria, which is no more than the size of Great Britain, is too closely settled to need this type of medical aid, and it takes under its wing, literally, the service of the Kimberley area, Western Australia, 1,800 miles from Melbourne. A federal meeting of representatives of the State councils is held once a year.

The annual expenditure on the service is about £130,000, of which £75,000 is contributed by the people for whom the service is rendered. No charge is made, but they give according to their means. They are people of all income levels, but, of course, the operating costs are heavy—a single flight may cost £80—so that a patient's contribution can often be only a token payment. A Government subsidy (which in no way implies Government control) varies from State to State, but totals about £30,000, and the remainder is raised by voluntary contributions and bequests.

Remote Diagnosis

A series of small communal hospitals or nursing-homes have been established and are visited by the flying doctors on routine inspection once a month. Every effort is made to carry out preventive treatment. Immunization of children against diphtheria, whooping-cough, and other infections is instituted. Antenatal clinics are set up. The doctor on his flight may on occasion be accompanied by an ophthalmic or other specialist or by a nursing sister. But this complex radio network is not used merely for summoning the doctor in emergency. The doctor at the base is called up constantly to make remote diagnosis and give advice and treatment over the radio. Here is a mother, 200 miles from hospital and perhaps 50 from her nearest woman neighbour, anxious about her baby. One can imagine the reassurance given by the doctor's voice on her radio set. A standard medicine chest is made available at every outpost. It contains the more usual medicines, palliatives, appliances, and accessories, all of them not only named but numbered. Patients or their relatives are encouraged to describe symptoms and appearances over the radio. They are given time to tell the story in their own words. Many of these outback settlers are well-educated people; and, even if not, they are more than usually intelligent, as one would expect, and accustomed to make keen observation. Dr. Vickers strongly insists that this is not a makeshift. The people know, too, that, if necessary, no matter how far away they may be, the doctor will visit them after an interval scarcely longer than an urban practitioner takes to answer a call from another part of the town in a busy practice, and that, again if necessary, they will have air ambulance transport and hospital care. The flying doctors themselves are highly trained men, often with special qualifications in addition to a thorough experience of general practice, and specialists in the cities are also available if need be.

It is computed that in the Flying Doctor service last year over 300,009 miles were flown, the individual flights numbering 1,100. Ten thousand patients were seen, of whom about 400 were transferred to hospital, and in addition 6,000 patients were given medical advice by wireless. Until last October there had not been a fatal accident, and there has never been an accident involving a patient. The educational possibilities of the radio system are also opening up, and it may expand in the direction of other communal amenities. But its first object is to cast, as it has done, a mantle of safety over these vast spaces, to break the dreadful silence for the lonely peoples, to bridge the gulf of geographical isolation, to make medical succour a matter of minutes or hours whereas it formerly meant days or weeks. But this is to be "glamorous," and that is what Dr. Vickers dislikes.

Correspondence

Cortisone and Aspirin in Rheumatoid Arthritis

SIR,—Dr. J. H. Glyn writes (*Journal*, June 12, p. 1376) that statisticians prefer to answer a single question at a time—that is, "If to a defined type of patient Y gr. of drug X are given daily by one particular route in so many divided doses, what happens?" He appeals to them to modify this "rigid approach" and to make the question asked of a trial read: "Does drug X, given under *optimum* conditions (as judged by experienced, reliable, and unbiased clinicians), give better results than drug Y?"—leaving the clinicians to select both the patients and to adjust the dosage schedules to individual requirements. Dr. Glyn quotes from a paper I published in 1952, and yet he seems to have ignored the fact that I fully answered his appeal in that paper of two years ago. This is what I wrote:

"In testing a new form of treatment knowledge at first is necessarily scanty, being usually based upon laboratory work and a few scattered clinical observations. In Medical Research Council trials we have thought it proper, therefore, to choose such a regimen as promised to reveal the potentialities (and often the dangers) of the drug (or whatever may be concerned). Thus we have a tidy question—for example, if to a defined type of patient 2 gr. of drug X are given daily in four divided doses by intramuscular injection and for three months, what happens?

"But perhaps the question is too tidy. We can, of course, extend it after its answer has been reached by experimenting with variations upon the original theme. It may, however, be argued, and sometimes, I think, legitimately, that allowance should have been made during the basic trial for individual idiosyncrasies, that the clinician should have been free to vary the dosage according to his own judgment of the patient's needs as shown by the latter's responses. Statistically, I see no reason why that should not be done. . . . The question asked of the trial . . . now runs 'if competent clinicians in charge of defined types of patients use drug X in such varying amounts and for such varying durations of time, and so forth, as they think advisable for each patient, what happens?' The moot point is which question, in given circumstances, is the better one to ask."

Dr. Glyn also accuses statisticians of "choosing certain highly inaccurate assessments (such as joint tenderness and range of movement) as a means of overall assessment, whilst ignoring entirely such imponderable but important clinical features as the degree of stiffness and the patient's sense of well-being." Personally, I have repeatedly said and written how important it is to bring the "imponderable" features into clinical trials, particularly when that can be achieved in such a way that bias in the observer (or patient) can be discounted. There is nothing new in that idea. Where Dr. Glyn goes particularly astray, in my view, is in his odd ideas of the part statisticians play in these trials. He seems to regard them as dictators and the "experienced, reliable, and unbiased clinicians" as their puppets. That, fortunately, has not been my experience. I have spent many hours, as a co-worker in a trial, listening to clinicians framing the questions, deciding on the dosages, determining diagnostic criteria and arguing about means of measuring the results. It is clearly their job to do so and mine to collaborate in determining the appropriate "experiment" that flows from their desires and views. It is entirely collaborative work. If "highly inaccurate assessments" are introduced at that time, then the clinicians must take the major part of the blame—after all, it is their field of knowledge. If during the trial clinicians admit wholly unsuitable patients to it—that is, they ignore the rules they themselves framed—then they are wholly to blame. But in working with clinicians I have always found them more than anxious to abide by their own rules.

I am not here concerned with the particular trial which has moved Dr. Glyn to these criticisms but with the general issues that he has raised. In brief, the statistical rigidity against which he tilts is far less than he imagines and the statistical dictatorship is a myth. If it should ever cease to be a myth I would be happy to enlist under his flag and to join in the attack.—I am, etc.,

London, W.C.1. A. BRADFORD HILL.

Fitness, Fertility, and Blood Group

SIR,—Your annotation under this heading (*Journal*, May 22, p. 1197) ends by referring to the need for studies of blood group distribution in (amongst other populations) children of different ages and sexes. It has recently come to my notice that the material for one such study is available from data obtained by Vuori[1] in an effort to find a relation between the ABO groups and the weight, height, and intelligence of healthy Finnish State and high school children. Having found that samples of group B individuals give consistently different results from samples of A and O individuals in investigations relating to viability and fertility—a fact which might be thought to lend some support to established phylogenetic belief—I have found it useful, on occasion, to consider A and O as a single group. When this is done with Vuori's data (table I) it is seen

TABLE I.—*Distribution of ABO Blood Groups in Finnish Children and Adolescents*

Total No. of Children	Ratio of B to A+O Children		Age of Children	Age of Adolescents	Ratio of B to A+O Adolescents		Total No. of Adolescents
	Male	Female			Male	Female	
				13	0·24	0·21	825
178	0·27	0·18	8, 9	14	0·23	0·22	646
447	0·24	0·24	10	15	0·25	0·23	418
705	0·21	0·22	11	16	0·23	0·27	341
841	0·21	0·26	12	17	0·31	0·28	246
				18	0·18	0·35	142

that, in later childhood and again in adolescence, the incidence of B in this sample, relative to that of A plus O, shows, for the most part, a fall in males and a rise in females as age increases.

The only other relevant data known to me is that provided by ten of the twelve samples making up Waterhouse and Hogben's[2] series of 1,239 families with 4,139 children of unstated age but stated birth-rank. Here, omitting the families with twins or only one child, the ratio of male to female children is 1.24 (63:51) for the B *youngest* children and 1.08 (57:53) for the B *oldest* children, whilst it is 0.97 both for the A and O youngest children together (365:377) and for the A and O oldest children together (370:381); and there are slightly fewer B's and slightly more A's and O's in the oldest than in the youngest children. It may be recalled that in Sanghvi's[3] sample of newborn infants of unstated birth-rank the ratio of males to females is 1.33 (281:212) for B and 1.12 (827:739) for A and O together. Certain findings on the sex-ratio of well and ill adults—that is, British blood donors and Finnish hospital patients—will appear elsewhere.

Your annotation also refers to my analysis of the Waterhouse–Hogben series from the standpoint of fertility, but this analysis can be taken a further step in view of the circumstance that the Waterhouse–Hogben series is made up of six samples with an average of 2.69 children per family and six with an average of 4.16 per family. The possible importance of this variation in family size is seen from the fact that while in the smaller-family samples as a whole the descending order of fertility of fathers is B–O–A, in the larger-family samples as a whole it is O–A–B, whether the father's group is the same as, or different from, the mother's (table II). Should such differences prove to be real, one of their possible explanations, or part explanations, would be that fertility in B males may decline with age more quickly, from a higher level, than fertility in A or O males (see Hirszfeld's[4] heterogeneous series of 7,700 families with only 2.13 children per family, and also the work of Kirk, Kirk, and Stenhouse[5] on fertility in mothers).

TABLE II.—*Comparative Fertility of Fathers (White)*

Samples with an Average of 2·69 Children per Family				Samples with an Average of 4·16 Children per Family			
Father's Group, and Average Family Size, when Mother's Group the Same		Father's Group, and Average Family Size, when Father's Group Different from Mother's				Father's Group, and Average Family Size, when Mother's Group the Same	
B	3·20	B	2·94	4·23	O	4·27	O
O	2·82	O	2·65	4·21	A	3·87	A
A	2·62	A	2·58	4·16	B	3·83	B

In the Waterhouse–Hogben series the descending order of fertility of mothers of a different group from their husband is A–O–B in both the smaller-family and larger-family samples as a whole—a fact which gives interest to Vuori's[1] small-scale material on abortion. In Vuori's series of 348 matings the incidence of abortion was nearly twice as high in the B mothers as in the A or O mothers—this finding has lately been repeated both by Sjöstedt, Grubb, and Linell[6] and by Allan[7]—and when one omits the matings where husband and wife have the same group, the incidence of abortion in the remaining B mothers rises to more than twice that of the A and O mothers (table III).

TABLE III.—*Incidence of Abortion in Finnish Families with Father and Mother of Different ABO Groups*

No. of Families	No. of Abortions	Group of Father	Ratio of Families to Abortions		Group of Mother	No. of Abortions	No. of Families
86	7	A	12·3	13·1	A	7	92
84	9	O	9·3	12·0	O	7	84
53	7	B	7·6	5·6	B	8	45

In addition there are slightly more A mothers than A fathers in Vuori's sample, and considerably fewer B mothers than B fathers. Vuori also ascertained the menarche-age of 244 schoolgirls, and, while the average age at menarche was 14.3 years for both the A and O girls, it was 14.7 years for the B girls.—I am, etc.,

Aberdeen T. M. ALLAN.

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7 *Lancet*, 1952, **1**, 102.

Insulin Resistance

SIR,—The stimulating paper by Dr. J. Beattie (*Journal*, June 5, p. 1287) raises many points of interest, but I would like to be allowed to criticize his interpretation of the results. The author's view that insulin resistance in adrenal-medullectomized animals with hypothalamic lesions is due to increased amounts of growth hormone and adrenal cortical steroids appears to be untenable. The most striking findings in these animals are the hypoglycaemia and the low glycogen content of liver and muscles. Both growth hormone[1] and adrenal corticoids[2] have been shown to increase blood sugar and glycogen stores. Moreover, the author has already shown that the hypothalamic lesions probably do not interfere with pituitary function,[3] and it seems strange that a procedure designed to disturb autonomic control should result in such profound changes in hormonal balance.

It has long been suspected that the autonomic pathways are concerned in the emergency response of the organism to hyperglycaemia and excess insulin. In the present experiments, interruption of the hypothalamic–adrenal system resulted in a complete unresponsiveness to glucose and insulin. This is certainly what one would expect in the case of glucose, though it is difficult to explain why these animals were not more, instead of less, sensitive to insulin. Is it possible that the adrenal response to insulin is not due to hypoglycaemia, but occurs earlier as a direct effect of insulin on the autonomic nervous system? This is, of course, highly speculative, but it seems that some alternative explanation for the present findings must be sought, since there is little evidence of true insulin resistance.—I am, etc.,

London, S.E.1. A. PATON.

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2 Long, C. N. H. (1953). *Ciba Foundation Colloquia on Endocrinology*. 6, 136.
3 Beattie, J., and Chambers, R. D. (1953). *Quart. J. exp. Physiol.*, **38**, 87.

Undergraduate Education

SIR,—In reference to Mr. Aleck Bourne's letter (*Journal*, June 5, p. 1321) on undergraduate education, I feel that "what have been the opinions of many of us for years" need re-emphasis, and now more so than ever, since we seem in medicine to be entering a period when the call on the laboratory, the ancillary aids, and the physicist is growing.

I will not agree that it is wrong for students to be told what can be done in rare, major, or obscure cases, but I feel that the primary function of teaching in medicine is to turn out general practitioners who can use their tongues to ask the patient questions, their ears to hear their replies, and their fingers to feel the lesion. This, I am sure, is not forgotten, but, as one who is not connected with a teaching school and who frequently has a new product to deal with, one undoubtedly gets the impression that the present-day student is taught more about the various forms of gastrectomy, pneumonectomy, and cardiovascular surgery, and laboratory diagnosis than was the case in the past and that this, unfortunately, seems to mean a sacrifice in the type of knowledge which is needed in practice—for example, the diagnosis of strangulated hernia, the reduction of dislocated shoulder, the treatment of varicose ulcer, and the recognition of the acute abdomen and the knowledge of when a patient is ill. I am quite sure that many of the very best general practitioners know little or nothing of the techniques of major surgical or laboratory procedures and would be wasting their time to learn, and that emphasis should be on the common things in practice, and attaining enough knowledge to deal with them or refer their difficulties to the correct place if necessary. I cannot help feeling that giving the student sound and definite teaching on what to do with the type of cases he is likely to meet would result in the young practitioner having greater confidence and make the hospital out-patient department less necessary to him. Less of the academic and more of the realities of medicine must be kept before the student, and for this reason there is much to be said for him doing a period of work with a general practitioner.

I feel sure that the good student of to-day is as good as in the past, and the worst no worse, but that the emphasis on what is important is tending to be misplaced. Could it be that now in the teaching schools the house-surgeon has less responsibility than in the past, since registrars and others have increased in number and the duties of house-surgeons now were largely the duties of students in the past, and the student of to-day does little of a practical nature in the ward as part of the team?

With regard to the teaching of psychology, I have no suggestions to offer. The *sine qua non* of this subject I feel is that the doctor must not "lose the common touch." For a doctor to regard his case as a "chest," a "heart," a "gastric," or anything else, and to carry out treatment, however correct, without reference to the patient's thoughts, feelings, or fears, stamps that doctor as one on whom no amount of teaching of psychology will have any effect. The rest of us have, perhaps, learnt a little psychology through force of circumstance. The height of my own knowledge of mental disease was that I once thought that I knew when a patient was mad, though not perhaps the medical term to put on his particular madness. Now, I am not so sure that I even know madness when I meet it.—I am, etc.,

Ballymena, Eire. W. S. HANNA.

Blood Groups and Gynaecological Cancer

SIR,—The data on blood groups of patients with gynaecological cancer given in the article by Drs. Erik Krokfors and Olavi Kinnunen (*Journal*, June 5, p. 1305) do not bear the interpretation which the authors place on them. Deviations from expectation equal to or greater than those reported would be expected in 15% of similar series even were there no difference between the groups.

Group	A Control	B Total Cancer Patients	C Cancer Patients Under 45 years
O	98	113	42
A	139	110	33
B	48	57	17
AB	25	20	8
Total	310	300	100

The analysis of two 2 × 4 tables gives values of χ^2 (for 3 degrees of freedom) of 5.609 for the comparison of A with B, and 5.025 for the comparison of A with C; both values correspond to a probability of about 0.15.—I am, etc.,

London, N.W.10. GEORGE DISCOMBE.

Syme's Amputation

SIR,—In your brief report of Mr. J. H. Shelswell's remarks on Syme's amputation at the annual meeting of the British Orthopaedic Association (*Journal*, May 29, p. 1258) the point is made that the necessary prosthesis is bulky, and therefore this amputation "was seldom indicated in women." Yet there is an important consideration in favour of this level of amputation from a long-term "cosmetic" point of view.

Unfortunately, the very young sometimes suffer grave foot injuries from run-over accidents. When foot amputation in these young people is necessary, a Syme's amputation allows constant weight-bearing and an early fitting prosthesis that has not to be changed at frequent intervals as growth proceeds. With such constant weight-bearing the lower limb grows to its normal length. When growth is ended the choice of a higher level of amputation can be made by the lady herself. Yet I have a patient who in her first decade of life had a Syme's amputation and now, 65 years later, she has a leg equal in length and, with its prosthesis, apparently equal in function to its normal fellow. I doubt if she would at any stage have appreciated the attention of a "cosmetician."—I am, etc.,

Birmingham, 15. WILLIAM GISSANE.

Restriction on Aureomycin

SIR,—I was astonished to see on sale to the public a veterinary preparation containing 3.6 g. of aureomycin. Surely it is time that the ludicrous situation in regard to this valuable drug was ended. Aureomycin has been extensively used in this country for six years. Its attributes and limitations are widely known. Judging from reports in medical journals, it is lavishly used in hospitals, perhaps too lavishly. A general practitioner, however, can only obtain it on application to a recognized centre, for the treatment of a few uncommon diseases.

Aureomycin has been manufactured in this country for at least four years. It is available in a poultry food. Why is it being withheld for general practice? Erythromycin, a drug with fewer applications, is freely available. The discovery that aureomycin and terramycin are practically identical makes the ruling even more difficult to understand. Aureomycin is a well-established drug, and it seems absurd that its use should still be monopolized by hospitals. It is hoped that the practice of withholding drugs from general practitioners will end with the early release of aureomycin.—I am, etc.,

Wells. J. PINCHING.

Geriatric Nursing Annexes

SIR,—It is clear from the survey of the geriatric unit in St. Alfege's Hospital for 1952 by Dr. A. J. Mester (*Journal*, June 5, p. 1317) that this unit is doing most valuable work, but I do not think that his advocacy of "nursing annexes" should pass unchallenged. Such annexes when established would soon become veritable homes of the unwanted dying and perpetuate the depressing hopelessness of such institutions. Admission to them would be worse than a death sentence and would have a most unhappy reaction on patient and relatives alike. It is possible that the very dread of them might stir up some to undertake the care of their aged relations, but there are other more humane ways of teaching the duty to provide for parents in their old age. Let us rather mix the cases for whom treatment may be of avail to relieve if not to cure with the less hopeful who need only nursing, so that by their improvement or recovery hope may pervade and stimulate the minds of the sick and their kin, and the work of the attendants on them, whether professional or lay.—I am, etc.,

London, E.C.1. C. O. S. BLYTH BROOKE.

Chloramphenicol for Athlete's Foot

SIR,—May I ask Dr. Francis J. Evans (*Journal*, May 29, p. 1267) if he had an opportunity of confirming the diagnosis and cure of his cases of epidermophytosis by direct or cultural investigation? Also, what type of fungi were found to be present?—I am, etc.,

Leicester. JAMES OVERTON.

An Unusual Case of Acute Retention in Women

SIR,—Recently a lady of 67 years of age was admitted to hospital complaining of lower abdominal pain of 12 hours' duration and the inability to pass urine for 24 hours. On examination the bladder was found to be almost as high as the umbilicus. The vagina showed signs of a senile vaginitis, and its upper part had been obliterated, presumably by these changes. Examination per rectum revealed a large, tense, uniform swelling anterior to the rectum. A tentative diagnosis of impaction of a fibroid was made and laparotomy was decided upon. At operation the uterus was exposed through a lower midline incision. The swelling was seen deep down on the posterior aspect of the uterus. Hysterectomy was considered the treatment of choice. During the freeing of the "fibroid" it burst, releasing a large quantity of dark viscid blood. On examination the "fibroid" was revealed as a large haematocolpos. The uterus was removed and a drain was made to pass through the obliterated vagina.

Later it was found that she had been treated for a stenosing senile vaginitis with tab. stilboestrol. 1 mg. every day, some two months before (menopause occurred at 47 years of age). Apparently uterine bleeding had occurred into the upper portion of the obliterated vagina to produce this haematocolpos which led to acute retention.—I am, etc.,

London, N.18. EDWARD T. R. HOLT.

Alcohol

SIR,—I often think that the attitude of our profession to the use of alcohol might be more clearly defined. G. K. Chesterton in his book *Heretics* says: "There is only one legitimate use of alcohol and that is to get drunk on it." I believe this to be a perfectly true statement. By getting drunk he means that its use is to make a man merry and of a glad countenance when he is in cheery company. Few will deny that a dinner or a dance goes with more swing and fun when champagne goes round. This is probably due to the fact that it lessens one's powers of self-criticism and makes one have a better opinion of oneself. I do not deny the scientific fact that alcohol is ultimately a depressant and that it lengthens one's time of reaction to stimuli. But, and it is a very big but, there are many who do not use alcohol for its legitimate purpose. They use it to fulfil a

physical or mental need either to relieve a pain or because they are tired, or because they have a job in front of them which will tax all their energies and they hardly feel up to it, or because they are afraid. Worst, and most unsocial, of these is the man who has a long cold drive in front of him and takes "one for the road." These people are walking on the edge of a precipice. In my young and unregenerate days I have to confess that I often drank more than was good for me, but it was always in good cheery company, and I was never a bit the worse except for an occasional "head" and a rise in my mess bill. I am now well into my 85th year and can put in a 10-hour day's work seven days a week.

When I was in India and had a very large and hard practice in a somewhat trying climate, often when I paid one of my visits at the end of the day someone would say: "Oh, you are looking tired. Have a whisky and soda." I always answered: "Yes, I am tired and that is why I won't have a whisky; a cup of coffee if you have it. When I have had a bath and a change and get to the club and meet a few cheery friends I will have a drink, perhaps even two." When I commanded a hospital in Mesopotamia I used always to say to my youngsters: "The Old Man shuts his eyes on a guest night, but if I see you taking short drinks through the day to help you get through your work —well, I don't like it and I shan't like you," and their response was excellent. We should preach this doctrine far and wide: "Never, never take alcohol to fulfil a physical need."—I am, etc.,

Taynuilt, Argyll. P. F. CHAPMAN.

Sickle-cell Anaemia in Uganda

SIR,—It is time to correct the impression, several times referred to in your columns, that sickle-cell anaemia is rare in Uganda; rare, that is, in comparison with its expected frequency on the supposition that it is the expression of the homozygous state for the sickling gene in children. Since one of us was partly responsible for this impression as regards Africa as a whole, it is appropriate that we should record our denial of it as far as Uganda is concerned. The original statement was made after a comparison of the published reports up to 1949, from America and Africa respectively. At that time the information about African children in this respect was meagre in the extreme, and the idea of the homozygous basis of the anaemia was only being formulated. Having noted a difference in the reports of the incidence of anaemia in sickling persons from the two continents, Raper[1] concluded: "Any deductions drawn from this difference must of course be treated as subject to revision if more accurate information should be obtained." No conclusions were drawn as to the frequency of the anaemia in Uganda.

In subsequent years more accurate information rapidly accumulated, notably in the excellent study by J. and C. Lambotte-Legrand[2] from the Belgian Congo, which showed the anaemia to be as frequent as expected around Leopoldville. These authors insisted that one should look for the anaemia amongst very young children, a notion that did not appear even by implication in the American literature before the days of the homozygous theory. Foy and others[3] reached similar conclusions in Kenya. In Uganda, Hutton[4] has analysed the admissions to the children's ward of Mulago Hospital, Kampala, and concluded that the anaemia occurred with about the expected frequency. We have examined haematologically a series of children under 10 years of age, attending (for whatever cause) the out-patient clinic at the same hospital. Amongst 350 children, 4 definite cases of sickle-cell anaemia were detected, and 2 others were recorded in whom this was the probable diagnosis, though not yet confirmed. The expected frequency is in the region of 1% of all children born.

The above figures refer to children selected by their attendance at hospital. However, for some years we have been making clinical and pathological observations on children under 5 years of age attending child welfare clinics around Kampala. In the last two years, 422 new entrants to the clinics were Baganda, and 237 were Nilotics. In the former the gross sickling rate was 18.5%, and in the latter 20%. Amongst these 659 children there should have been (if the parents exhibited a similar sickling rate) about 7 homozygous for the sickling gene. In fact we observed 12 unrelated cases of sickle-cell anaemia amongst them. Though less selected than hospital cases, children attending the clinics would present a somewhat higher proportion of the sick than exists in the general population. We therefore consider that sickle-cell anaemia is at least as common in this part of Africa as would be expected on genetic grounds.—We are, etc.,

HEBE WELBOURN.
Kampala, Uganda. ALAN B. RAPER.

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4 Ibid., 1953, **30**, 75.

Diagnostic Difficulties in Conservative Treatment of Perforated Ulcers

SIR,—In his article (*Journal*, February 13, p. 374) Mr. T. G. Crombie is right to suppose that conservative treatment will stand or fall by the number of errors of diagnosis and their results. It is a pity, however, that his criticism is based, not on practical experience, but on the theoretical results of what he imagines would have happened if his own patients, treated by operation, were treated by the alternative method; and it is a pity also that he deliberately refrains from considering the results of mistakes of the operation policy—that is, operating on wrongly diagnosed coronary thrombosis for example. Finally, he is mistaken in supposing that the surgeon, having decided on treatment by aspiration, is bound to follow the method according to rigid rules instead of altering his treatment according to the progress of the case.

It is possible to illustrate these points by taking the last two years at this hospital. There have been 64 actual perforations and many more cases of "widespread peritoneal irritation" due to other causes. Four of the latter were erroneously considered to be perforated ulcers and were treated initially by aspiration. In fact two cases were appendicitis and two were internal strangulations. The error in each case soon became apparent by the clinical progress; operation was undertaken and all four cases made a satisfactory recovery. Of the 64 actual perforations, the diagnosis was uncertain in five; laparotomy was performed and the ulcer was sutured. In another five cases conservative treatment was not satisfactory and operation was performed. All these ten patients recovered. The remainder were treated without operation. Four patients were moribund on admission and died. They were not at any time suitable for operation. There were no deaths in the series other than these. It is difficult to refrain from suggesting that Mr. Crombie should follow John Hunter and "try the experiment," but, if he does, let him please not omit the *x* ray. The exact position of the tube and the amount of gas under the diaphragm and in the stomach are crucial points in the management of these cases.—I am, etc.,

Ilford, Essex. R. P. WARREN.

Infectious Mononucleosis

SIR,—Dr. Peter Wolf's attempt (*Journal*, May 29, p. 1265) to identify infectious mononucleosis with a positive Paul–Bunnell test is deprecated. It is well known, even to haematologists, that a few other conditions may sometimes give rise to a blood-count *similar* to that found in infectious mononucleosis. It should be emphasized here that one or two odd "glandular fever cells" are not diagnostic and that a repeat blood-count will help in either confirming or excluding the diagnosis. In a case with sufficient clinical (or laboratory) evidence of some other disease, and with a typical blood-count of infectious mononucleosis, I would

not hesitate to declare a mixed infection, even in the absence of a positive Paul–Bunnell test. While it is true that a positive Paul–Bunnell test is probably diagnostic of infectious mononucleosis, it is equally true that a negative test does not exclude this condition, and I feel confident that it is not dishonest to base a diagnosis of infectious mononucleosis either on haematological or on clinical and haematological grounds in spite of a negative Paul–Bunnell test.—I am, etc.,

Sheffield. S. VARADI.

Dangers of E.C.T. in Cerebral Arteriosclerosis

SIR,—Dr. G. I. Tewfik (*Journal*, April 10, p. 876) refuted the concept of arteriosclerotic dementia in order to replace it by the term "post-apoplectic dementia." There already exists the general term "cerebral arteriosclerosis," which comprises all those cerebrovascular conditions with focal neurological signs which are not associated with dementia. Within this wide group we find a percentage of cases correctly labelled arteriosclerotic dementia, differentiated by psychometric tests[1] which correlate with psychometric findings.[2] Whether the dementia remains static for a number of years between strokes or is progressive is beside the point. To state, as Dr. Tewfik did in his second letter (*Journal*, May 15, p. 1153), that "the dementia, if it occurs, is related to the apoplexy, and not the arterial lesion," is illogical, as both apoplexy and dementia are caused by arterial lesions; it all depends on the site and extent of the lesions and the degree of compensation of remaining healthy brain.

To treat such cases with E.C.T. is risky. The following case illustrates this: Retired bricklayer, aged 66. Complained of breathlessness on exertion, and stiffness in calves on walking 300 yards (0.27 km.), relieved by stopping. Depression one month: believed he had sinned by retiring, that he hadn't a friend in the world, and that the police would arrest him for drawing N.H.I. money without being entitled to it. His memory was markedly impaired, he thought the year was 1935, didn't know his year of birth, and couldn't give the dates of the last war. He knew the correct day and month and knew he was in a hospital. He had partial insight. He was clean and tidy and his behaviour was not very distinguishable from that of a patient in a general hospital. He was orthopnoeic and showed marked left heart failure with a blood pressure of 210/115. Blood urea =37 mg.%. Marked peripheral and retinal arteriosclerosis. Exaggerated deep reflexes, especially left knee jerk. E.C.G. showed left ventricular strain. He had treatment for four weeks with rest, digoxin, and hexamethonium which reduced his blood pressure to 155/85 and lessened his myocardial decompensation. Mentally he became worse, was more depressed and refused food, arguing that he was depriving other patients of what belonged to them. His memory was bad and he admitted it. In view of his refusing food it was decided to give him E.C.T. modified by succinylcholine. He made a satisfactory recovery from the first treatment, but died a few minutes after the second treatment (0.1 g. thiopentone 5% with succinylcholine 0.4 ml., patient weighing 121 lb. (55 kg.)) a week later.

An inquest was held and necropsy carried out. Findings were: Cerebral arteries atheromatous and narrowed, popliteal vessels atheromatous and calcified; left heart much enlarged and myocardium very fatty. Coronaries atheromatous. Mitral and aortic valves and aorta atheromatous. Verdict: "Death by misadventure accelerated by electric convulsion therapy." This case illustrates the risk involved in treating a man with generalized arteriosclerosis and cerebral ischaemia by E.C.T.

Another case illustrates how cerebral ischaemia was produced by E.C.T. and gallamine triethiodide with a resultant permanent hemiplegia. A lady aged 52 was admitted suffering from depression and dizziness. Blood pressure 110/80. History of asthma since childhood. Heart, nothing abnormal discovered. C.N.S., nothing abnormal discovered. W.R. and Kahn negative. *X*-ray chest normal. *X*-ray lumbar spine: osteoarthritic changes. Commenced course of E.C.T. with gallamine triethiodide, all went well until the sixth treatment, given exactly one month after the first (0.8 mg. gallamine triethiodide, plus 0.25 g. thiopentone intravenously). There was some coughing after the treatment. Appeared normal till 3 p.m., when vomited greenish material, became cyanosed with rales and rhonchi in left chest. Quite clear mentally till an hour later when vomited again and became semicomatose: colour then good, heart sounds normal. Right face and leg paralysed next day with right Babinski. Speech affected. Albumin and hyaline casts present in urine. Nine months later she still had little use in her right hand, though her speech was much better. She remained depressed on discharge 11 months after admission.

I feel sure that this patient had had either a cerebral embolism following sudden right heart failure due to chronic asthma, or cerebral thrombosis, in either case resulting from E.C.T. with secondary fall in blood pressure. It follows that in a case of cerebral arteriosclerosis (which may remain latent till a sudden stress arises) one must curb one's natural enthusiasm for E.C.T. till all the pros and cons have been discussed, and the responsibility for any serious consequences shared with another colleague.—I am, etc.,

Willerby, Yorks. F. HOUSTON.

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[2] Pinkerton, P., and Kelly, J. (1952). Ibid., 98, 244.

Chromobacterium Prodigiosum

SIR,—With regard to the rare infectivity of this saprophyte, and to the case reported by Drs. A. J. Hawe and M. H. Hughes (*Journal*, April 24, p. 968), I would like to draw your attention to a case of purulent meningitis, caused by *Chr. prodigiosum*. Papers about its medical and bacteriological aspects were published in *Harefuah*[1] and later abstracted in *Schweizerische Medizinische Wochenschrift*.[2]

An infant suddenly showed symptoms of nervous irritation. On a slide made of the purulent cerebrospinal fluid were found, between the leucocytes, Gram-negative bacilli, morphologically and biochemically resembling *Serratia marcescens*. This strain proved *in vitro* to be resistant to sulphaguanidine, sulphadiazine, penicillin, and streptomycin, but sensitive to aureomycin and chloramphenicol. It was also pathogenic to mice.—I am, etc.,

Tel Aviv, Israel. JACOB LEVY-ZAKS.

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[1] *Harefuah*, 1952, 42, 87; 89.
[2] *Schweiz. med. Wschr.*, 1953, 83, 70 and 115.

SIR,—Drs. A. J. Hawe and M. H. Hughes (*Journal*, April 24, p. 968) might like this story, which is true. A middle-aged man arrived in my panel surgery about 20 years ago. He was the forty-fifth patient that evening, and I was getting slightly shirty. He began with preamble of apology for wasting my time. When it had lasted for five minutes or so, I suggested that he should come to the point. Taking a long breath, he said: "Well, doctor, not to put too fine a point on it, as you might say, I'm sweating blood." So I said, "Oh, God, so am I. Do go away, there's a good fellow. There are still twenty of you outside." So he said, "S'welp me, doctor, it's true," and took off his shirt, and his axillae were all clotted up with what looked like blood clot, only there wasn't any wound. So I cut off his axillary hair and put it in an envelope and took it to that great man Alexander George Gibson, and next day he said (in the language of those days): "It's *Bacillus prodigiosus*. It's what the crooked priests used to use for doing miracles with." Unfortunately, I had given him a mercurial lotion to wash with and it cured him, so I couldn't demonstrate his case to the Section of Ecclesiastical Medicine at the R.S.M.—I am, etc.,

London, W.1. RAYMOND GREENE.

Weight-lifting

SIR,—Some years before the war, and before qualification, I held a commission in the Royal Corps of Signals. The rigging of airline poles was by means of a hole in the ground sunk with a 14-lb. (6.4-kg.) sledge and a 36-lb. (16.3-kg.) "jumper." The latter is like a vast cold chisel some 2½ in. (6.4 cm.) in diameter, which is driven into the ground for about a foot (30 cm.). It is loosened by a few side blows, and is then pulled out. A regular part of the instruction for pulling it out was that the signalman should straddle the instrument, with his feet together and his knees bent, and then straighten his knees; arms were to be kept

straight all the time, acting merely as linkages. Drs. Cyriax and Herford may be interested to know of this teaching, which was certainly standard twenty years ago.—I am, etc.,

Manchester, 20. ROBERT OLLERENSHAW.

Apocrine Gland Infection

SIR,—Concerning the annotation on apocrine gland infection (*Journal*, May 22, p. 1198), I saw such a case in 1951, with chronic inflammation of both axillae, much more severe on the left than the right.

At operation on July 3, 1951, the whole of the scarred area of the left axilla was excised and a free graft inserted. The pathological report was as follows: "Chronic purulent inflammation surrounding epidermal inclusions (probably from old scarring) in axilla; dilatation of apocrine sweat glands conspicuous; little inflammation around follicles except in area of epidermal inclusions."

The inflammation of the right axilla was not so severe in degree but later became worse and the patient requested me to operate, which I did on December 8, 1953, again excising the inflamed area and grafting (in both cases a thin razor graft was used). The pathological report on this specimen showed chronic purulent inflammation surrounding partly epithelial-lined cavities.

The stay in hospital on the first occasion was 17 days, and on the second occasion 12 days. This shows the benefit of excision and immediate grafting.—I am, etc.,

London, E.1. CHARLES L. HEANLEY.

Doctors and Clergy

SIR,—Owing to increasing interest in the relationship of medicine and religion, a meeting has been arranged at Glasgow on July 3 at 8.15 p.m. in the ballroom of the Central Hotel to discuss the subject. The chair will be taken by the Rev. Dr. Nevile Davidson, Minister of Glasgow Cathedral, and the speakers will be Dr. Arthur Pool, previously Medical Superintendent of the Retreat, and the Rev. J. A. C. Murray, Minister of Tolbooth-St. John's Church, Edinburgh. The general title of the discussion will be "The Spiritual Factor in Therapy." All doctors in Glasgow and members of the Association attending the Annual Meeting are invited.

The Churches' Council of Healing, whose President is His Grace the Lord Archbishop of Canterbury, exists to promote co-operation between medicine and the church, and to co-ordinate the various bodies working in the field of the ministry of healing. With the exception of the Roman Catholic Church, practically all Christian denominations are represented; and the British Medical Association has recently added to its existing representation. The Archbishops of Canterbury and York have recently appointed a Commission to consider "the theological, medical, psychological, and pastoral aspects of 'divine healing,'" and to increase understanding and co-operation between clergy and the medical profession. The British Medical Association is considering evidence which it has been asked to give to the Commission.

We hope that this meeting in Glasgow will stimulate interest in this matter, and direct it along sound and useful lines. Health, in the full sense of the word, is the specific business of both professions or ministries. They have an equal interest in its promotion and an equal responsibility for the tasks which this entails, health of body and soul being one of the ultimate demands of the human spirit. We wish to discuss and study the implications of the matter in loyalty to scientific method, and with minds open to whatever is revealed through men and women inspired by the spirit of truth. In this way, we believe that we can help to make more effective the work of clergy, doctors, and all who realize that health is God's will for us, and that its achievement is something to be claimed and demonstrated.—I am, etc.,

London, W.1. J. BURNETT RAE,
Chairman, Executive Committee,
Churches' Council of Healing.

SIR,—The correspondence initiated by the Rev. Tony Clemens (*Journal*, April 24, p. 983) has shown the interest there is in the profession in the symbiosis between clergy and doctors, but I would go further than Dr. S. F. Gilbert (*Journal*, May 22, p. 1209), who clearly recognizes that spiritual balm is of more value than phenobarbitone. This catharsis he recommends (I use the technical term) is of value, but if the conception behind his use of the word "balm" is that of soothing or finding solace then this is quite inadequate. It is of such an attitude Karl Marx speaks when he refers to religion as the opiate of the masses.

We must as a profession realize that we are merely the attendants at birth, sickness, and death. It is the man of God who can tell us whence we came and whither we are going, and what is the purpose of life, and, though as a profession we are usually sadly guilty of keeping our patients ignorant concerning life and death, we ought to feel that no matter what our personal religion is we should not keep them in ignorance, if they want to know, of the likelihood of their leaving Time for Eternity in the foreseeable future. It is not spiritual balm we mainly need but courage and faith. As Studdert Kennedy so well put it: "We offer too much the comfort of the cushion and not that of the Cross."—I am, etc.,

Southampton. A. OAKLEY JOHN.

Homosexuality

SIR,—I am sorry that Dr. C. G. Learoyd (*Journal*, June 5, p. 1326) has written such a letter on homosexuality; just as it seemed to me that the article which he recently published in *The Practitioner*[1] was singularly unfortunate. I wonder why he feels competent to write so dogmatically when I can find no record of him having performed any research on this condition. Dr. Learoyd paints a terrible picture of the dreadful results which must follow any alteration of the law. Surely this must be due to ignorance on his part. The Napoleonic Code which has influenced Continental law, and still rules France, makes homosexuality a crime only when committed with a child, a soldier, or in public so as to cause offence. I have not noticed in my visits to France that the French are more homosexual than we are in England—the reverse seems very much the case. One would like to know upon what facts Dr. Learoyd makes his gloomy prophesies.

My own view is that homosexuality is an illness. Naturally the young must be protected from the abnormal, just as the public must be protected from the dangerous schizophrenic. I think that the homosexual who has urges to

interfere with children and youths should be treated, but if he does not respond he should be confined—not necessarily in prison—for the rest of his life where he can do no harm: not given a sentence of a few years and then released more dangerous than he was before. Homosexuality should always be discouraged, since many young men who think that they are abnormal are really only immature. They are balanced on the razor's edge and often can easily be tipped on the right side into normality. However, surely there is a difference between discouragement—possibly by means of a fine and consequent publicity—and sending a man to prison for 15 years because he has indulged in a sexual act with another man with the other man's consent. This is the present state of the law.

The crux of the whole matter is that greater facilities for treatment should be set up, and these would automatically lead to wider research. We shall cure this illness only as we cure other illnesses, by increasing our knowledge and by applying what we have learned—not by bludgeoning the sufferers, no matter how much we disapprove of them.—I am, etc.,

London, W.1. CLIFFORD ALLEN.

REFERENCE

[1] *Practitioner*, 1954, 172, 355.

SIR,—While we will all honour Dr. C. G. Learoyd's letter on homosexuality (*Journal*, June 5, p. 1326) for its simple honesty of feeling and expression, I suggest that we should refrain from expressing our "confidence that the committee will report" in any particular way. When we make such statements as this it is because we *fear* that the contrary may be the case, which may reflect on the competence or trustworthiness of the committee and may prejudice their findings. We all, Dr. Learoyd no less than any of us, are in favour of the proposed investigation, as we are only too aware that the present legislation regarding sexual crime is totally inadequate: instead of protecting any victim from assault or illness it invites the potential blackmailer to commit the darkest crimes. As Christians and physicians all our aim and interest is centred in love and healing, neither in condemnation nor punishment.

In my psychiatric practice I have witnessed at first hand the terrible sufferings of the homosexual patient. Analytical psychotherapy has often helped these patients to a considerable degree, and I hope that it will be possible to make such treatment available to all these sufferers. May the committee, under God's guidance, lay the corner stone to a new and more effective attitude towards homosexuality among the people of this nation and their leaders.—I am, etc.,

Edinburgh. W. P. KRAEMER.

Herpes Zoster and Chicken-pox

SIR,—The letters of Dr. C. Spencer Whitehouse (*Journal*, May 8, p. 1097) and other contributors on herpes zoster and chicken-pox occurring together prompt me to record the following unusual case which might be termed herpes zoster siné herpes with chicken-pox, or chicken-pox producing a focal nerve cell lesion.

A man aged 69 was first seen on March 22, 1954, complaining of three days' continuous pain in the right upper chest and general malaise. The pain had become progressively more severe. On examination the area of pain corresponded roughly with the cutaneous distribution of the first three thoracic nerves on the right. Skin temperature 99° F. (37.2° C.), pulse 80 per min. He had a right Horner's syndrome of which he was unaware, and a few scattered papules and vesicles on the chest, back, and face. No other abnormality of the nervous system was found. Heart and lungs N.A.D. There was no history of contact with either herpes zoster or chicken-pox.

By March 25 there were lesions scattered over the chest, back, and abdomen, with a few on legs, arms, face, and scalp, and a single vesicle on the soft palate. The lesions included macules, papules, vesicles, and pustules, and in character and distribution the rash was indistinguishable from that of chicken-pox. The chest pain, malaise, and Horner's syndrome were I.S.Q. By March 29 the pustules were all dry and the rest of the rash was aborting; malaise no longer present, chest pain much less severe and Horner's syndrome unaltered. Seen on April 16 he was free from pain and rash and felt well; the Horner's syndrome was still present but less marked. Chest *x*-ray, differential white cell count, and B.S.R. were all normal. At no time was there any sign of a herpetic eruption in the painful area.

This patient would appear to have had a viraemia producing a rash indistinguishable from that of chicken-pox together with a focal lesion involving posterior-root ganglia and lateral horn cells in the upper thoracic region.—I am, etc.,

Leeds. G. W. LEWIS.

Relief for Entropion Sufferers

SIR,—Crutch spectacles for both ptosis and entropion have been known to ophthalmologists for more than 50 years,[1] and, although I am unable to supply references, I think it is probable that sight-testing and dispensing opticians have been making them since the introduction of the curl side spectacles. The use of a crutch spectacle in the treatment of entropion has become less popular during the last few decades because the surgical treatment on the whole is simple and effective.

Dr. Cecil W. C. Robinson's letter (*Journal*, May 1, p. 1037) serves to emphasize that the classical "skin and muscle" operation for senile spastic entropion gives little more than 60% success, even in the best hands. Both the term senile spastic entropion and the principle underlying the "skin and muscle" operation are based upon a misconception. The condition is due not to a spasm of the marginal fibres of the orbicularis oculi muscle, as was believed, but to loss of tone and thinning of the part of the orbicularis supporting the lower border of the tarsus of the lower lid. Stretching of the skin and tarsus appear to be contributory factors. The lower lid is kept in snug apposition with the eyeball by a balance in the tone of two groups of fibres of the orbicularis—namely, the fibres along the margin of the lower lid and those in relation to the lower border of the tarsus. If the marginal fibres become lax, the lid margin falls away from the eye and ectropion occurs. If the fibres supporting the lower border of the tarsus are affected, the lower border falls away from the eye and entropion is the result.

The removal of the marginal fibres, as in the skin and muscle operation, may relieve the condition, but operations designed to increase the support to the lower border of the tarsus are more effective. Wheeler[2] has designed two such operations, and both are simple to perform and most effective. Severer cases of senile entropion or recurrences, in which the lower lid is very lax, are best treated by shortening it as in the Kuhnt–Szymanowski operation for ectropion.[3] The principles of treatment are ably discussed in an article by Kirby.[4]—I am, etc.,

Winnipeg, Canada. HOWARD REED.

REFERENCES

[1] Oppenheimer, Eugene (1901). *Dtsch. med. Wschr.*, 27, 827.
[2] *Amer. J. Ophthal.*, 1939, 22, 477.
[3] Stallard, H. B. (1950). *Eye Surgery*, 2nd ed., p. 152. John Wright and Sons, Bristol.
[4] *Amer. J. Ophthal.*, 1953, 36, 1372.

POINTS FROM LETTERS

Prostatic Obstruction

Mr. D. M. O'CONNOR (Launceston, Cornwall) writes: Some time before the war I wrote a letter which you published describing a case in which a male patient had complained of retention of urine after taking amphetamine ("benzedrine"), then a relatively new drug (*British Medical Journal*, 1937, 1, 43). Someone more knowledgeable than I am pointed out (*British Medical Journal*, 1937, 1, 93) that this effect was to be expected because of the similarity of its action with that of ephedrine. As the only reference given in your correspondence on May 1 (*Journal*, May 1, p. 1036) is to a book published two years ago (Hale-White, *Materia Medica*, revised by A. H. Douthwaite, 1952, London), others may be as unaware as he that this topic was at least mentioned 15 or 16 years ago.

Obituary

A. O. FERGUSSON ROSS, M.D., D.P.H.

The death occurred at Birkenhead on June 3 of Dr. A. O. Fergusson Ross, director of the venereal diseases clinics of the city and port of Liverpool and adviser in venereal diseases to the Liverpool Regional Hospital Board. He was 59 years of age.

Andrew Oliver Fergusson Ross was born at Scone, Perthshire, on January 21, 1895, and was educated at George Watson's College and at Edinburgh University, graduating M.B., Ch.B. in 1917. He proceeded to the M.D. four years later. After graduation he held house appointments at Edinburgh Royal Infirmary, where he was surgeon to the out-patients department, and at Monkwearmouth and Southwick Hospital, Sunderland. He served in the first world war as a surgeon-probationer in the Royal Navy, later becoming a specialist in genito-urinary surgery and venereal diseases at the Royal Naval Hospital, Haslar. After the war he entered a partnership at Manchester, but soon gave up general practice to become a consultant in Glasgow.

Dr. Fergusson Ross was appointed venereal diseases officer for the city and port of Liverpool in 1926, the year in which he took the Liverpool D.P.H. He also became lecturer in specific diseases in the University and consultant to the Royal Liverpool United Hospitals and the Liverpool Seamen's Dispensary. Soon after the inception of the National Health Service he was appointed adviser in venereal diseases for the Liverpool region. He was a member of the British Medical Association's Venereologists Group Committee from 1951 until his death, and when the Association held its Annual Meeting at Southport and Liverpool in 1950 he served as a vice-president of the Section of Dermatology.

R. J. M. writes: The many learned papers Dr. Fergusson Ross has contributed to the literature showed his brilliant brain, his fearless refusal to edit other men's opinions, and his absolute integrity. Though a man of world-wide repute, he always retained the humility of the true student, and in the art and practice of his profession his own financial interests and personal comforts were matters of least moment. Though struggling through the shallows of the mortal illness which finally engulfed him, his stern sense of duty caused him to prepare and deliver six brilliant lectures for the World Health Organization at Rotterdam. Indeed, he never lost the urge to question, to seek, and to verify, so that all his teaching bore these hallmarks. I think it no exaggeration to say that all who met him were impressed by his deep love of humanity, by his unfailing courtesy, and by his forgetfulness of self. No man ever loved the quiet things of life more than he did—his family, his friends, his garden, the way of the countryside, the thrust and parry of good conversation, and the story that was apposite. He was a true Scot, proud of Scottish virtues and achievements, full of pawky humour, jealous for the reputation of his brother Scot; a man of great probity and judgment who found it more blessed to give than to receive. All his life a sincere Christian, he was received into the Catholic church in 1950. Our sympathy goes out to her who knew the secret places of his heart, to his three sons and only daughter, and to all those who are mindful of

> "That best portion of a good man's life,
> His little, nameless, unremembered acts
> Of kindness and of love."

E. E. P. writes: By the death of A. O. F. Ross we have lost not only one of the most distinguished venereologists of the day but a man possessed of an exceptionally broad background of knowledge. He was keenly interested in the welfare of seafarers, and generations of them have reason to be grateful for his care and attention. Our friendship, begun in 1926, ripened as the years went on, and my association with him, professionally and socially, tended ever to increase my admiration. He was a great doctor and a delightful host. He had unfailing sympathy and understanding and a great sense of humour, the latter making him a most amusing correspondent. His enthusiasm and burning zeal were contagious. He shone as a teacher and never spared himself on behalf of his students, endearing himself to all. Our hearts are heavy at his going.

KATHLEEN L. PRENDERGAST, Ph.D., B.Sc. M.R.C.S.

The death of Major Kathleen L. Prendergast, R.A.M.C., at Glasgow on June 1 has left an empty place, which will be hard to fill, in the small band of medical women who so faithfully serve the Army. Kathleen Laura Prendergast was born in South Australia on November 17, 1910. She graduated B.Sc., with honours in geology, at the University of Western Australia in 1936, taking the Diploma in Education later in the same year. At first she made a special study of palaeontology and had published work on the subject. After a year as palaeontologist to an oil company she continued her work at Newnham College, Cambridge, on a Hackett Research Studentship, and took the Ph.D. in 1939. She then turned to medicine, studied at King's College Hospital, and qualified M.R.C.S., L.R.C.P. in 1944. After holding house appointments at King's and at Horton Hospital, where she was house-surgeon to Sir William Gilliatt, she was commissioned in the R.A.M.C. and went to Germany in 1945. From 1946 to 1951 "Mick" Prendergast, as she was affectionately known, was medical officer to the 1st Battalion the Black Watch, a most unusual appointment for a woman, and one which she filled with great distinction. It was in this position that she was able to give full scope not only to her undoubted talents as a physician but also to her truly remarkable qualities of character and personality. She threw herself heart and soul into the life of the regiment, and was respected and beloved by all ranks and by their families. In the art of medicine she excelled, for her clinical skill and judgment were built on a sure foundation of sound common sense and deep humanity. She was never guilty of treating the disease rather than the patient, and soldiers—not always the most articulate of mortals—would always confide in her. Her greatest attribute was her absolute integrity both of character and of purpose; never did she deviate by one fraction from the line of conduct she believed to be right. In manner she was decisive, outspoken, and often critical, for she demanded of others her own high standards of conduct. She strode through life without fear, and her bravery in her last long illness was in keeping with the rest of her courageous life. Her funeral took place at Glasgow with full military honours. In addition to the traditional pipe-music laments at the graveside, the tune "Australian Ladies" was played as her coffin was borne from the church on the shoulders of the men of the Black Watch—the regiment she served so faithfully and loved so well.—P. C. M.

The Rt. Hon. ARTHUR GREENWOOD, M.P.

Mr. Arthur Greenwood, who died on June 11, was Minister of Health in the short-lived Labour Government of 1929–31. In the earlier Labour Government

of 1924 he had had a brief experience as Parliamentary Secretary to the Ministry. He brought to the task a sound training in economics, in which subject he had been lecturer in the University of Leeds. His tenure of ministerial office was marked chiefly by his zeal for post-war housing, which was then within the scope of his department. At that time the Ministry of Health seemed to be tenanted by flitting figures, and Greenwood himself was the seventh Minister in 10 years. His place in the niche of fame will not be due to anything he did as Minister of Health, but rather to his initiative as one of the progenitors of the Welfare State, for it fell to him as Minister without Portfolio in the Churchill Government during the last war to appoint what is officially known as the Interdepartmental Committee on Social Insurance and Allied Services, which sat in 1941–2. Thus he briefed the then Sir William Beveridge to work out in detail the plan which has had such momentous consequences in the social life of this country. Greenwood, who had been in Parliament with one short interruption since 1922, had a likeable personality. One of his Labour colleagues, the late Harold Laski, writing of him when he was Minister of Health, described him as an idealist but also as a hard-headed Yorkshireman who would be ashamed if any stranger suspected it. He was an excellent chairman of committees, able to reconcile conflicting views, and he secured in an unusual degree the affection of his party and of very many outside it.

Dr. WILLIAM GORDON, a well-known and highly respected general practitioner of Birmingham, died at his home at Moseley on May 19 at the age of 87. William Gordon was born at Banbridge, Co. Down, on March 15, 1867, and was educated at the former Queen's College, Belfast, taking the Scottish triple qualification in 1897. Just before the turn of the century he settled in Birmingham, when he soon built up one of the largest practices in the Sparkhill district. He was most painstaking in his work and never spared himself where the interests of his patients were concerned, many of whom will always be grateful for his kindness and for the fatherly advice which he was ever willing to give when they were in trouble or ill. He was very popular, too, with his colleagues in the medical profession. Dr. Gordon took a keen interest in public affairs. He entered the city council in 1934 and remained on it for 16 years, during which time he served on the public health committee, and he was chairman of the maternity and child welfare committee. He was also a member of the Birmingham Executive Council. A man of perfect integrity, loyal to his many friends, and always co-operative, the sympathy of all who knew him will go out to his widow and his son, Dr. W. L. Gordon.—W. McM.

Dr. C. CHARNOCK SMITH, who was a well-known and highly respected general practitioner at Hastings for a quarter of a century, died at Stroud, Gloucestershire, on May 11, at the age of 82. Charles Charnock Smith was born at Hulcote, Bedfordshire, on November 25, 1871, the sixth son of the Rev. Boteler Chernocke Smith—the spelling of the second name was changed later—and was educated at Bedford and at the Middlesex Hospital, where he was captain of the rowing club. After qualifying M.R.C.S., L.R.C.P. in 1898 he held the appointments of assistant and, later, senior house-surgeon at the County Hospital, York, from 1900 to 1902. A brief period in practice at York followed before he returned to the south of England in 1904, to Steyning, in Sussex. In 1908 he moved to Woburn, Bedfordshire, where he was in practice for the next twelve years. At Woburn, as later at Hastings, he was held in high esteem, and he was appointed a justice of the peace for Bedfordshire. During the first world war he served as an anaesthetist at the Duchess of Bedford's base hospital. In 1920 Dr. Charnock Smith finally settled in practice at Hastings, where he soon began to take an active interest in the affairs of the British Medical Association. He was honorary secretary of the Hastings Division from 1922 to 1926 and assistant secretary in 1926–7, reassuming the duties of the honorary secretary during the last war. He was also chairman of the Division in 1927–8, president of the Sussex Branch in 1930–1, and on two occasions he represented his constituency at the Annual Representative Meeting. It was chiefly owing to the energy and enthusiasm that he brought to the work of honorary secretary that the Hastings Division became such an active unit within the Association. A man of fine presence and with the courteous manner of his generation, Dr. Charnock Smith was deservedly popular with his colleagues and patients, both at Woburn and at Hastings. He left Hastings soon after the end of the last war, during which he carried on the practice single-handed while his two partners were on active service, and he went to live in retirement at Stroud. He is survived by his widow, formerly Miss Hermione Pearson.

Medico-Legal

MINISTER'S DECISION FINAL

COURT POWERLESS TO INTERFERE

A case of some importance in a matter of principle was the subject of a considered judgment by Mr. Justice Cassels in the Queen's Bench Division on June 4. Mr. T. J. Healey, a shoemaker, of Bridgend, Glamorgan, employed by the Morgannwg Hospital Management Committee, in an action against the Minister of Health contested the Minister's decision that Mr. Healey was not a mental health officer within the meaning of the National Health Service (Superannuation) Regulations, 1950.

For Mr. Healey it was contended that the Ministry had designated as a mental health officer all who were employed partly or wholly in mental hospitals, and that as Mr. Healey, in his capacity of shoemaker, instructed mental patients in hospital he therefore came within the Ministry's definition. For the Minister it was submitted that under the Regulations and the National Health Service Act, 1946, his decision was final and therefore the court had no jurisdiction to grant the plaintiff any relief.

The Judgment

Mr. Justice Cassels, giving judgment, said that the case raised a question of considerable importance regarding the rights of a citizen to seek redress in the High Court and to contend that a determination of the Minister was wrong, and the powers of the court to review the determination of a Minister made under an Act of Parliament and statutory regulations. The plaintiff by his action was in effect saying that the Minister had determined wrongly, and was appealing notwithstanding that no appeal was provided for in the Act or the Regulations. His lordship said that, in the light of the authorities and the plain words of the regulations, he was precluded from exercising such discretion as he had in favour of Mr. Healey. "I hope," concluded Mr. Justice Cassels, "that Mr. Healey has derived adequate satisfaction in the knowledge that for this departmental decision against him the Minister is answerable to Parliament." There would be judgment for the Ministry of Health on the preliminary issue, with costs.

Leave to appeal was granted.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **May 29** (No. 21) and corresponding week 1953.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	13	0	9	0	0	21	2	10	1	1
Dysentery	1,136	142	321	6	2	505	65	115	11	
Encephalitis, acute	6	1	0	0		3	0	0	0	1
Enteric fever:										
Typhoid	1	0	0	0	0	2	0	1	0	1
Paratyphoid	2	0	1	0	0	8	0	0	1	
Food-poisoning	173	20		0		147	17		2	
Infective enteritis or diarrhoea under 2 years				17	18				16	21
Measles*	2,046	42	218	175	314	9,012	269	455	283	301
Meningococcal infection	32	0	16	0	0	41	5	21	2	1
Ophthalmia neonatorum	50	4	9	1		41	5	8	0	
Pneumonia†	428	21	162	5	0	446	22	168	9	2
Poliomyelitis, acute:										
Paralytic	10	2	3	0	2	30	5	2	2	
Non-paralytic	6	1				22	2			
Puerperal fever§	229	29	14	2		283	48	10	1	
Scarlet fever	911	60	135	37	51	1,084	72	175	33	56
Tuberculosis:										
Respiratory	862	99	213	31				157	16	
Non-respiratory	128	7	25	7				22	1	
Whooping-cough	2,207	81	304	36	27	2,476	228	451	54	124

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0		0
Dysentery	0	0		0		0	0			
Encephalitis, acute		0	0		0		0			0
Enteric fever	0	0	0	0		0	0			
Infective enteritis or diarrhoea under 2 years	9	1	2	1	1	11		1	4	0
Influenza	5	0	0	1	0	8	0	2	0	1
Measles		0	0	0	1		0	1		0
Meningococcal infection		0	1				1	0		
Pneumonia	210	34	20	8	6	178	26	15	8	3
Poliomyelitis, acute	0	0	1		0	3	0			0
Scarlet fever		0	0	0	0		0	0		0
Tuberculosis:										
Respiratory	81	11	12	5	7	81	4	10	0	6
Non-respiratory			2	2	0		2	1	0	2
Whooping-cough	0	0	1	0	0	1	0	1	1	0
Deaths 0–1 year	233	24	26	8	9	211	18	26	11	11
Deaths (excluding stillbirths)	5,108	679	595	115	185	4,353	644	487	109	154
LIVE BIRTHS	7,942	1116	901	239	520	7,380	1088	945	237	464
STILLBIRTHS	188	17	21			194	35	14		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Vital Statistics

Food-poisoning at Brighton

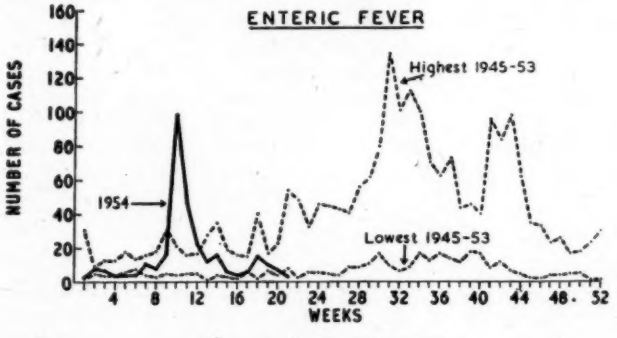
Fifteen of a group of 22 campers spending the Whitsun week-end (June 5–7) at Brighton were taken ill with symptoms of nausea, headache, shivering, drowsiness, photophobia, and in one case delirium. Gastro-intestinal symptoms were not prominent : vague abdominal pain has been common, but diarrhoea occurred in only one case and vomiting was almost absent. The diagnosis appears to be a true poisoning as opposed to acute infection of the gastro-intestinal tract. The differential diagnoses are botulism (or a mild variant of it), an unrecognized bacterial exotoxin, or a chemical poison such as tri-ortho-cresyl-phosphate. The symptoms suggest some form of neurotoxin. The time of onset of symptoms has been variable, and, in view of there being no common latent period or period of incubation, it seems that the same toxic agent has been ingested at varying times rather than that a single common meal has caused the upset. No cases are known to have occurred outside the group of campers, so the implication is that the toxic agent was restricted to the confines of the camp. There was no common food other than tea or coffee, which limits the extent of the investigation. Three girl guides from East Grinstead and one boy scout from Horley who were ill at the same time were not associated with the above episode and were not, in fact, suffering from food-poisoning.

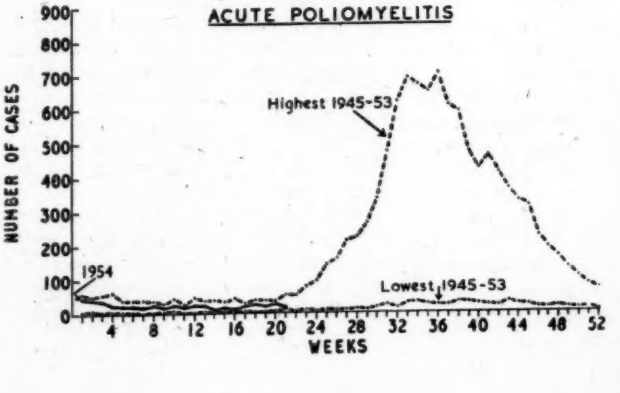
Week Ending June 5

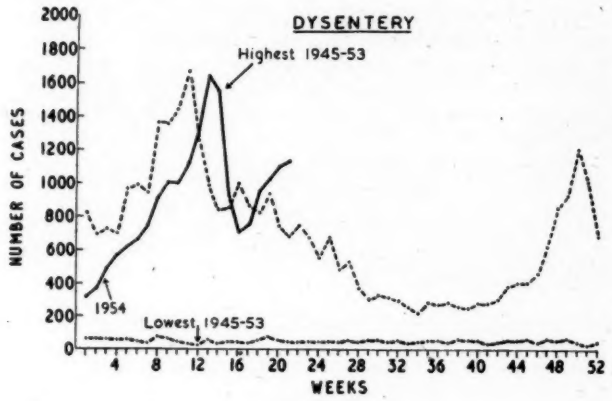
The notifications of infectious diseases during the week included pneumonia 417, scarlet fever 793, whooping-cough 1,989, diphtheria 18, measles 2,834, dysentery 1,017, acute poliomyelitis 34, paratyphoid fever 6, and typhoid fever 3.

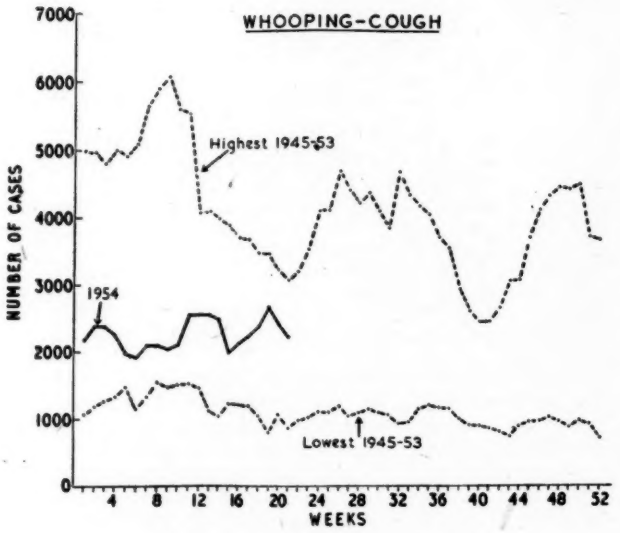
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945–53 are shown thus - - - - - - -, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Infectious Diseases

The largest variations in the returns for infectious diseases in England and Wales during the week ending May 29 were increases of 106 for measles, from 1,940 to 2,046, 79 for scarlet fever, from 832 to 911, and decreases of 212 for whooping-cough, from 2,419 to 2,207, and 92 for acute pneumonia, from 520 to 428.

The largest increase in the local returns of measles was 118 in Yorkshire West Riding, from 137 to 255; this was due to a rise in Thorne R.D. from 27 to 116. The other large variations in the trends of measles were a decrease of 64 in Yorkshire North Riding, from 147 to 83, and an increase of 67 in Lancashire, from 397 to 464. Only small fluctuations were reported in the local trends of scarlet fever. 13 cases of diphtheria were notified, being 9 fewer than in the preceding week. The chief features of the returns of diphtheria were decreases in Lancashire, from 7 to 4, and in Devonshire, from 4 to 1. The only large fluctuation in the trends of the notifications of whooping-cough was a fall of 83 in Lancashire, from 294 to 211.

16 cases of acute poliomyelitis were notified and these were 7 fewer for paralytic and 3 fewer for non-paralytic cases than in the preceding week. The largest returns were Kent 3, London 3 (Westminster 2), Devonshire 2, Lancashire 2.

1,136 cases of dysentery were notified, an increase of 32 on the total of the preceding week. The largest returns were Yorkshire West Riding 193 (Dewsbury C.B. 46, Otley U.D. 33, Sheffield C.B. 28, Leeds C.B. 16), Lancashire 164 (Bolton C.B. 15, Salford C.B. 15, Liverpool C.B. 11, Manchester C.B. 11, St. Helens C.B. 11, Kearsley U.D. 10), London 142 (Islington 58), Staffordshire 104 (Cannock U.D. 35, Newcastle-under-Lyme M.B. 37, West Bromwich C.B. 11), Leicestershire 68 (Leicester C.B. 55), Essex 62 (Burnham-on-Crouch U.D. 26, West Ham C.B. 10), Middlesex 46 (Ealing M.B. 11, Tottenham M.B. 10), Cheshire 43 (Dukinfield M.B. 24, Ellesmere Port U.D. 16), Gloucestershire 42 (Sodbury R.D. 33), Sussex 37 (Brighton C.B. 16), Warwickshire 30 (Birmingham C.B. 14, Coventry C.B. 13), Durham 28 (Blaydon U.D. 17), Surrey 28, and Nottinghamshire 24 (Beeston and Stapleford U.D. 11).

In Scotland the largest returns of dysentery were 207 in Glasgow and 37 in Edinburgh.

Medical News

B.M.A. Library.—The Library will be closed and the library service suspended from July 30 to August 16 while redecorating is being done.

British Association of Paediatric Surgeons.—The inaugural meeting of this newly formed association will be held in London from June 30 to July 2 inclusive. The association was founded at the end of last year, when an invitation to join as foundation members was issued to all British surgeons engaged exclusively in the practice of paediatric surgery. In addition, an invitation to join as associate members was given to the members of the Surgical Section of the American Academy of Pediatrics and to 20 other foreign paediatric surgeons. The president is Mr. DENIS BROWNE (London). The inaugural meeting will include lectures and discussions, clinical demonstrations, operating sessions, an exhibition, and films. There will also be a dinner at the Apothecaries Hall. The morning sessions, which are to be held at the Royal College of Surgeons, Lincoln's Inn Fields, will be open to any doctor, without fee or ticket; anyone wishing to attend the afternoon sessions at the Hospital for Sick Children, Great Ormond Street, is asked to write to the secretary, Mr. DAVID WATERSTON, at Great Ormond Street. The programme of the meeting is as follows:

June 30.—Morning: Discussions on "Congenital Malformations of the Rectum and Anus" (opener, Mr. DENIS BROWNE), and "Acute Intussusception in Childhood" (opener, Mr. R. B. ZACHARY). *Afternoon:* Exhibitions of diagrams, photographs, radiographs, and pathological specimens.

July 1.—Morning: Discussion on "Cardio-oesophageal Syndrome in Childhood" (opener, Miss ISABELLA FORSHALL) and "Hiatus Hernia in Childhood" (opener, Mr. DAVID WATERSTON). *Afternoon:* Exhibition and demonstration of operations. Lecture and film, "Surgery of Conjoined Twins" (Professor IAN AIRD).

July 2.—Morning: Discussions on "Intestinal Obstruction in the Neonatal Period" (opener, Mr. H. H. NIXON) and "Peritonitis in the Neonatal Period" (opener, Mr. P. P. RICKHAM). *Afternoon:* Clinical demonstration on the correction of talipes, congenital dislocation of the hip, scoliosis, and torticollis by controlled movement (Mr. DENIS BROWNE).

British Rheumatic Association.—At a luncheon in London on June 10 an appeal was launched by the British Rheumatic Association for the "British Rheumatic Association Fund." It is estimated that rheumatism in one or other of its forms costs the country £250 million a year in production losses, sickness benefits, and medical care, and that three million working weeks a year are lost from the same cause. The object of the fund is to bridge the gap between advances in medical knowledge and the two or three million rheumatic sufferers by promoting services not yet included in official schemes. One of the chief objects is to provide hostels for early diagnosis and treatment and to interest industry in these hostels, and to help rheumatic patients to do useful jobs in home or factory despite their disability. The chairman of the British Rheumatic Association, the Right Hon. TOM WILLIAMS, M.P., presided at the luncheon, and the speakers were Lord HORDER, who emphasized the need to mobilize public opinion, as often it was only public opinion that could open doors; Sir WALTER PUCKEY, a prominent industrialist, who stressed the vital interest of industry in health; and Dr. FRANCIS BACH. The president, Lord NUFFIELD, was unable to be present.

Canadian Medical Association.—Dr. T. CLARENCE ROUTLEY retired on June 15 from the office of general secretary of the Canadian Medical Association, a position he has held for 31 years. He is succeeded by Dr. ARTHUR D. KELLY, formerly deputy secretary.

Dutch Siamese Twins.—On June 12 Dr. H. L. STRAAT, the leader of a team of Dutch surgeons, successfully separated 7-months-old girl Siamese twins at Leeuwarden in Holland. The twins were joined by an abdominal bridge of rather less extent than that connecting the Kano twins (see *Journal*, April 10, p. 831). Before the operation Professor IAN AIRD showed the Dutch surgeons his film of the operation on the Kano twins.

Medical Insurance Agency.—The annual meeting was held at B.M.A. House on June 3, with Dr. JAMES FENTON in the chair. The report presented by the committee of management showed that 1953 had been another year of record progress, in new business, in premiums, and in service to the medical and dental professions in every field of insurance. Correspondingly, the net profit was also greater than ever before: this is distributable solely to the medical and dental charities, which will benefit by £24,550. The total rebates of premiums granted to clients during the year also reached the highest peak hitherto—namely, £18,900. Retiring members of the committee re-elected were Dr. J. A. BROWN, Dr. J. T. INGRAM, Dr. G. ROCHE LYNCH, Sir HENRY SOUTTAR, and Professor R. J. WILLAN. New members elected were Professor ALAN KEKWICK, of the Middlesex Hospital, and Professor G. A. WISHART, of Glasgow. The engagement of additional staff and the leasing of additional premises to cope with the great expansion of business were recommended and adopted. Dr. JAMES FENTON was re-elected to the office of chairman for the ensuing year, and Dr. HENRY ROBINSON was re-elected as honorary secretary. The proceedings terminated with a hearty vote of thanks to the chairman for his services.

Rajkumari Amrit Kaur.—The High Commissioner for India held a reception in London on June 11 in honour of the Minister for Health for India, Rajkumari Amrit Kaur, who is visiting Britain. The reception was attended by British and Indian doctors. The Rajkumari became Minister for Health in the first Dominion Cabinet in 1947, and in 1950 was President of the Third World Health Assembly. She was for 16 years secretary to Mahatma Gandhi.

Royal College of Surgeons.—The medical directors general of the three armed Services attended the meeting of council on June 10 and presented medals for meritorious work in the medical field. Surgeon Commander J. L. S. COULTER, author of *R.N. Medical History of the War*, received the Sir Gilbert Blane Medal, Brevet Colonel H. D. CHALKE the Mitchiner Medal, and Squadron Leader R. R. L. PRYER the Lady Cade Medal (see also *Journal*, May 1, p. 1047). The following were co-opted to the Council for the year 1953–4 as representatives of various branches of medical practice: *General Practice*, Dr. O. C. CARTER; *Gynaecology and Obstetrics*, Professor A. M. CLAYE; *Otolaryngology*, Mr. MYLES L. FORMBY; *Anaesthetics*, Dr. BERNARD JOHNSON; *Ophthalmology*, Mr. A. B. NUTT; and *Radiology*, Dr. E. ROHAN WILLIAMS. Professor F. C. WILKINSON was invited to act as the representative of *Dental Surgery* on the Council.

Royal College of Surgeons in Ireland.—At a meeting of the College on June 7 Mr. IAN FRASER was elected president, and Mr. A. B. CLERY vice-president. Nineteen others were elected to the Council of the College.

Wellcome Research Laboratories.—Colonel H. W. MULLIGAN has been appointed head of the biological division of the Wellcome Research Laboratories, Beckenham, in succession to Dr. J. W. TREVAN, F.R.S. He will take up his duties there on September 1. Colonel Mulligan was in the Indian Medical Service from 1923 to 1947, for most of the time in the medical research department. During the war he became consultant malariologist, Persia and Iraq Command. In 1947 he went to West Africa, where he established the West African Institute for Trypanosomiasis Research. During his last three years there Colonel Mulligan was engaged in planning the co-ordination of medical research activities, and his efforts did much to pave the way for the inauguration of the West African Council for Medical Research which was established by Ordinance a few months ago.

Lady Tata Research Awards.—The Trustees of the Lady Tata Memorial Fund announce that, on the recommendation of the (European) Scientific Advisory Committee, they have made the following awards for research on leukaemia and allied diseases in the academic year beginning October 1, 1954:

Grants for research expenses: Dr. Astrid Fagraeus and Dr. Bo Thorell (Sweden), Dr. Jo Nordmann (France), and Dr. Arunachala Sreenivasan (India) (new award). *Senior Research Fellowships:* Dr. Jørgen Kieler (Denmark). *Scholarships (whole-time or part-time):* Dr. Ragna Rask-Nielsen (Denmark), Dr. Roger Robineaux (France), Dr. Flemming Kissmeyer-Nielsen (Denmark), Dr. Niels Aksel Stenderup (Denmark), Dr. Jørgen Ringsted (Denmark) (new award) and Dr. Jørgen Rygaard (Denmark) (new award). *Part-time Scholarship and grant for research expenses:* Dr. Maxime Seligmann (France) (new award). In addition, the period of tenure of a special scholarship awarded earlier this year to Dr. Gavino Negroni (Italy), for work at the Imperial Cancer Research Fund Laboratories, Mill Hill, will continue until April, 1955.

Royal Commission on Mental Illness and Deficiency.—The evidence given by the Ministry of Health and the Board of Control to the Royal Commission on the Law Relating to Mental Illness and Mental Deficiency has now been published as a pamphlet by Her Majesty's Stationery Office, from which it may be obtained, price 3s. net. This evidence was given on the first day of the Commission's hearings, May 4. Other evidence is to follow.

"Family Doctor."—The Trustees of the Medical Society of Victoria, which is amalgamated with the Victorian Branch of the B.M.A., are using part of the money of a bequest for promoting preventive medicine and healthy living to provide *Family Doctor* to 36 public libraries in Victoria.

Mr. Peyton Beale, honorary consulting surgeon to King's College Hospital, will celebrate his 90th birthday on June 20.

Sir Charles Dodds, F.R.S., received the honorary degree of Doctor of Science at the May Week ceremony at Cambridge.

Sir Rudolph Peters, F.R.S., will receive the honorary degree of Doctor of Science at the Foundation Day ceremony at Oxford on November 26.

Professor J. Trueta was invested with the medal of Chevalier of the Legion of Honour by the French Ambassador at a garden party at Oxford on June 9. The award is for his services to France during the war.

Dr. C. B. B. Downman has been appointed to the University readership in physiology tenable at the Royal Free Hospital School of Medicine, London.

Mr. D. J. Tibbs has been appointed to the post of Reader in Surgery tenable in the Newcastle division of Durham University.

Dr. G. Fitzgerald O'Connor has been elected Mayor of Abingdon, Berkshire.

COMING EVENTS

St. Cyres Lecture.—Dr. GRAHAM HAYWARD will deliver the lecture of the Institute of Cardiology in the Barnes Hall of the Royal Society of Medicine, 1, Wimpole Street, London, W.1, on June 25 at 5 p.m. The subject is "Pulmonary Oedema."

Postgraduate Course in Industrial Ophthalmology.—A course will be held at the Birmingham and Midland Eye Hospital from July 19 to 23. Further information may be obtained from the secretary, Department of Research, Birmingham and Midland Eye Hospital, Church Street, Birmingham, 3.

International Association of Gerontology.—The third congress will be held in London from July 19 to 23. Further information may be obtained from the honorary organizing secretary, Mrs. ANNE HUMPAGE, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, June 21

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 2 p.m., Professor J. Louw (Capetown): Pelvic Inflammation.
LONDON UNIVERSITY.—At University College Hospital Medical School, 5 p.m., Special University Lecture by Professor B. T. Mayes (University of Sydney): Post-partum Haemorrhage.

Tuesday, June 22

●INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. S. P. Meadows: Intracranial Aneurysms.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Professor R. J. Last: The Pectoral Girdle.

Wednesday, June 23

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At St. Matthew's Hospital, Burntwood, near Lichfield, 4 p.m., visit, followed by clinical meeting at 5.30 p.m.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Acantholysis.

Thursday, June 24

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Mr. D. L. Savill: Ankylosing Spondylitis.
●INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. M. J. F. McArdle: Plexus and Peripheral Nerves.
OXFORD UNIVERSITY.—At Nuffield Orthopaedic Centre, 8.30 p.m., Professor C. G. Rob: Present Status of Blood Vessel Grafting.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Dr. M. A. Partridge.

Friday, June 25

CAMBRIDGE MEDICAL SOCIETY.—3 p.m., clinical meeting.
INSTITUTE OF CARDIOLOGY.—At Royal Society of Medicine, 5 p.m., St. Cyres Lecture by Dr. Graham W. Hayward: Pulmonary Oedema.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY.—3.30 p.m., Mr. Kenneth G. Rotter: Otitis Media in Children and Infants. Clinical meeting for general practitioners.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. T. McW. Millar: Surgical Experiences in the Treatment of Obstructive Jaundice. 4 p.m., Dr. E. G. L. Bywaters: The Collagen Diseases.

Saturday, June 26

LONDON COUNTY MEDICAL SOCIETY.—At Ministry of Health Spinal Injuries Centre, Stoke Mandeville Hospital, Aylesbury, 11 a.m., clinical meeting.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Henderson.—On June 7, 1954, at York Maternity Hospital, to Joan, wife of Dr. Walter Henderson, of The Cedars, Huntington, York, a daughter.
Kennedy.—On June 5, 1954, in Belfast, to Ismene (formerly More), wife of Dr. C. Cotton Kennedy, of Lisnalea, Craigavad, Co. Down, twin sons.
Levy.—On June 6, 1954, to Enid (formerly Glyn), wife of Dr. Basil Levy, a son.
Moos.—On June 3, 1954, at Hammersmith Hospital, London, W., to Perin (formerly Jungalwalla), M.B., B.S., D.T.M.&H., wife of Jamshed S. Moos, M.D., M.R.C.P., a daughter—Dena.

DEATHS

Byrd.—On May 23, 1954, at 7, Cecil Avenue, Sale, Cheshire, Elizabeth Caroline Byrd (formerly Powell), M.B., Ch.B., M.Sc.
Forrester.—On May 28, 1954, Mrs. Gertrude Forrester, M.B., B.S., of Polsteads Farm, Bures, Suffolk, late of Enfield, Middlesex.
Frost.—On May 26, 1954, at Tenbury, Worcs, George Hewitt Frost, M.B., B.Ch., Lieutenant-Colonel, I.M.S., retired, aged 87.
Leslie.—On May 22, 1954, at "Bellevue," Passage West, Co. Cork, Thomas Christie Cyprus Leslie, O.B.E., L.R.C.P.&S.I. & L.M., Colonel, A.M.S., retired.
Midgley.—On May 28, 1954, at "Penshurst," Hale, Cheshire, Patrick Haworth Midgley, M.B., Ch.B., aged 64.
Ross.—On May 29, 1954, at Brackens, Dormans Park, East Grinstead, Sussex, Thomas Spinks Ross, L.R.C.P.&S.Ed., L.R.F.P.S., D.P.H., Lieutenant-Colonel, I.M.S., retired, aged 81.
Silvera.—On May 19, 1954, at Ibadan, Nigeria, Walter D'Aguilar Silvera, M.B., F.R.C.P.Ed.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Inheritance of Asthma

Q.—*A young married couple are anxious to adopt a baby, and have been told that the mother of one child in whom they are interested suffers greatly from asthma. They want to know the chances of the child developing asthma. The mother has three other children, but by a different husband. Unfortunately I have not been given the medical history of the siblings.*

A.—There is, of course, a definite risk of the child of an asthmatic mother developing asthma. The most recent work on the subject is by Schwartz,[1] who writes: "Supposing, for instance, that one of the parents has asthma while the other one is healthy, 50% of the children will be carriers of the gene, but only 40% of the latter—that is, about 20% of the children—will acquire manifest disease. Of these 20% about 13% will develop asthma, while the remaining 7% develop vasomotor rhinitis, Besnier's prurigo, or hay fever. If both parents are asthmatics, 75 to 100% of the children will be carriers of the gene, and 30 to 40% will manifest the disease—as asthma in 20 to 25%." (The remaining 10 to 15% would develop vasomotor rhinitis, Besnier's prurigo, or hay fever.)

REFERENCE

[1] Schwartz, M. (1952). *Acta allerg. (Kbh.)*, 5, Suppl. 2, p. 254.

Bone Development in Treated Cretins

Q.—*In cretinism, bone development is often retarded, as indicated by an abnormally low number of epiphyses visible on x-ray examination—for example, of the wrist. How soon after the institution of thyroid treatment may one expect the normal number of epiphyses to be visible on radiography?*

A.—Lawson Wilkins[1] studied the development of six cretins who came under observation between the ages of 11 and 28 months. In four cases the bone age was at the newborn level, in one case (aged 24 months) the bone age was that of 3 months, and in another (aged 28 months) 9 months. In 2 to 4 months after treatment with thyroid, 1–3 gr. (65–200 mg.) daily, centres of ossification appeared, and the bone age rose rapidly towards the normal developmental level and sometimes exceeded it.

REFERENCE

[1] *J. Pediat.*, 1938, 12, 429.

T.B. in House Dust

Q.—*I have heard of several instances of tuberculosis occurring in families occupying houses previously lived in by tuberculous patients. Is the explanation of this that the bacilli persist in the dust and infect the new arrivals? If so, what disinfection should be carried out to make a house safe after a case of open tuberculosis?*

A.—Dried tubercle bacilli can survive in the dark up to four or five months, but in unfiltered north room light only for a matter of days.[1] Dust from room surfaces has been said to be an important source of infection,[2] but Cruickshank[3] has been unsuccessful in isolating tubercle bacilli from the dust in two sanatoria and from tuberculosis wards in a general hospital. He estimates that under conditions of desiccation only 1 to 5% of bacilli remain alive after one to three days. It seems improbable that, with ordinary household standards of cleanliness and hygiene, the occupation of a house previously lived in by tuberculosis patients

would carry any important risk of contracting the disease. Between 60 and 75% of the population have been infected with the tubercle bacillus by the age of 20. A daily 'bus or tube journey in the rush hour is probably more dangerous than the circumstances mentioned; the latter may well be pure coincidence. To make a house safe after occupation by an infectious case the floors and flat surfaces can be damp dusted with 5% phenol (which kills tubercle bacilli in five minutes), all windows being left widely open to let in as much air and light as possible. This ventilation may be repeated daily for a week and the rooms then cleaned with a vacuum cleaner. Thereafter there should be very little chance of infection of subsequent occupants.

REFERENCES

1 Smith, C. R. (1942). *Amer. Rev. Tuberc.*, 45, 334; 46, 549.
2 Augustine, A. E. (1929). *J. prev. Med.*, 3, 121.
3 Cruickshank, R. (1948). *N.A.P.T. Bull.*, 11, 136.

Neuronal Pathways in Decerebrate Rigidity

Q.—*Decerebrate rigidity is a condition of reflex activity involving the lower motor centres of the cord with the vestibular nuclei and those of Deiters in the adjacent levels of the pons, the afferent impulses coming from the proprioceptors in the muscles and the vestibular organs. Section of the vestibular component materially reduces the degree of tonus and reflex movement (particularly in the forelimbs), but does not abolish the general condition. Cutting the dorsal roots, on the other hand, completely removes any semblance of rigidity. By what tracts do the fibres conveying the impulses from the proprioceptors in the muscles reach the vestibular and Deiterian nuclei after entering the cord by the posterior nerve roots?*

A.—Decerebrate rigidity can be regarded as a state of exaggerated postural tonus. In the spinal animal the existence of a response to stretch in the antigravity muscles is demonstrated by the presence of the knee and ankle jerks, though this extensor activity is overshadowed by the flexor response. Both extensor and flexor responses are abolished by section of the posterior nerve roots from the limb, since this breaks the lowest level reflex arc. In animals in which the brain stem is sectioned at the level of the corpora quadrigemina the posture of exaggerated reflex standing develops; where a hemisection only is performed the posture develops upon the side of the hemisection only. In such decerebrate preparations the rigidity is abolished not only by section of the dorsal roots from the affected limbs but also by section of the brain stem below the level of the vestibular nuclei or by section of the ventral quadrants of the cord—with their vestibulo-spinal tracts. The condition may thus be regarded as a modification of the activity of the purely spinal reflex arc brought about by the activity of the vestibular apparatus. It is likely that, in addition, ascending fibres from the posterior nerve roots terminate in the lower brain stem, as they do in the mesencephalon, around cells from which such tracts as the vestibulo-spinal arise. The detailed course of such fibres is not known.

Cycling and Varicose Veins

Q.—*Is it wise for a man of 69 with bad varicose veins to cycle in moderation? Does not exercise without putting weight on to the limb help to strengthen the muscles and improve the circulation?*

A.—In the absence of any other contraindication there would appear to be no objection to a man of 69 with bad varicose veins cycling in moderation. Any form of rhythmical activity of the lower limbs, such as walking, dancing, cycling, etc., tends to diminish the venous congestion caused by varicose veins. For these reasons patients are often much more comfortable when performing these rhythmical activities than when standing, sitting, or walking slowly and unrhythmically. In this way cycling in moderation could be described as "improving the circulation." In addition the improvement in muscle tone would probably increase the subjective comfort of the limbs.

The real risk of cycling to such a patient is that of injury from the pedals, etc., to the lower parts of the legs, especially the shins. Such injuries might be serious in the presence of a marked degree of skin congestion. For this reason such patients are advised to wear either elastic stockings, crêpe bandages, or even shin guards for cycling.

Visual Development in Infants

Q.—*In what order and at what ages do the functions of a baby's eyes develop? Is a premature baby deficient in its powers of vision?*

A.—Babies begin to appreciate a light within a few days of birth, and then a few weeks later they are usually capable of keeping both eyes directed upon moving objects. As the macula has not nearly completed its development by the time of birth it is impossible for babies to discriminate detail until they are a few months old. The higher grades of binocular vision (including stereoscopic vision) take several years to develop. There is wide variation between different subjects. The vision of a premature baby is less acute than that of a full-term baby because the development of a premature baby's macula is behindhand.

Oestrogen Ointment and Acne

Q.—*Recent American literature contains several articles upholding the efficacy of oestrogenic inunctions in the treatment of acne. What are your views on this form of treatment?*

A.—The use of ointments containing oestrogens is neither necessary nor desirable in the treatment of acne under ordinary circumstances. It is sometimes employed with advantage in older patients or very resistant cases, but it is an uncertain measure. There is ready absorption of oestrogens through the skin which may have disturbing systemic effects unless care is taken. The normal proprietary ointments contain 2.5% of oestrogen and should be used only for one week in four or upon some such plan.

NOTES AND COMMENTS

Rosehip Syrup.—Dr. C. ALLAN BIRCH (Enfield) writes: The method of preparing syrup from rose hips described in "Any Questions?" (May 29, p. 1277) is a rather laborious way of preserving some of their vitamin C. That boiling was detrimental to some virtuous property (vitamin C) in rose hips was evidently known to our forefathers, as shown in an ancient recipe for rosehip conserve which I came across some years ago. It consisted simply in cutting up the hips (minus seeds) and pounding them with an equal weight of sugar or honey. No heat was used. I made some and was interested to find that the vitamin C content remained the same a year later.

Correction.—Dr. C. L. COPE writes: "In the paper by myself and Dr. J. Garcia-Llaurado which appeared in the *Journal* of June 5 (p. 1290) we wrongly attributed the adrenal cortical extract 'eucortone' to Burroughs Wellcome and Co. Eucortone has, of course, been made by Allen and Hanburys Ltd. for more than twenty years, and we apologize to the firm for any embarrassment we have caused them by this mistake."

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